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Introduction and First-Aid Overview

Most workplace and community injuries and illnesses are minor. These incidents normally involve a person who is breathing. An illness or accident becomes life-threatening when the event affects the amount of oxygen required by the body's tissues and organs.

If the oxygen level drops and continues to be low, the results can be: organ failure, brain damage and death. Within 4 minutes, brain damage can occur.

ATEM offers training classes that will help you learn to deal with immediately life-threatening situations as well as basic first aid.

How and When to get Emergency Help

When should medical care be sought? Below are specific conditions that warrant calling 911. Do not wait for a doctor to call back before calling 911. These conditions are time sensitive and could have serious medical consequences. This list is not complete.

- Anaphylaxis
- Chest pain
- Confusion
- Dizziness
- Drug O.D.
- Heart attack
- Heat stroke
- Puncture wounds
- Poisoning
- Serious Burns

When should 911 be called?

- Is the victim's condition life or limb threatening?
- Could the victim's condition worsen and/or become life or limb threatening.
- Could moving the victim cause further injury?
- Does the victim need the skills of EMS?
- Would distance or traffic cause a delay in getting the patient to the hospital?

- Sudden slurred speech
- Sudden blindness or vision issues
- Uncontrolled nosebleed
- Vomiting blood, or persistent vomiting
- Problems with movement or sensation
- Bleeding that will not stop
- Broken bones visible through an open wound
- Unequal pupil size
- Injuries to the hands or face

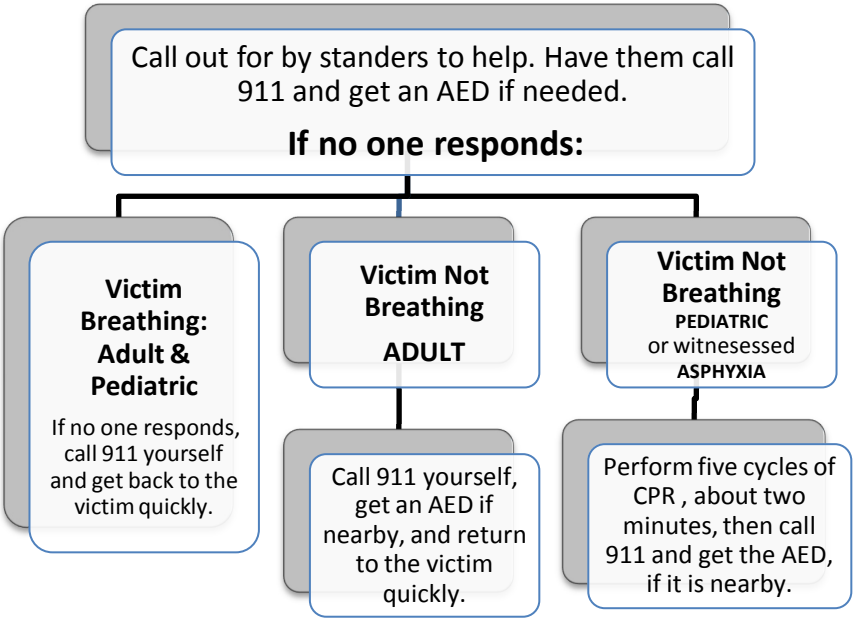
You can't help a victim if you become one yourself.

Assessment of the Scene

Before approaching a victim, assess the scene. Be aware of the dangers that you, in rendering first aid, or the victim might encounter. These can include obvious dangers such as traffic, gas or chemical leaks, live electrical items, buildings on fire or falling objects. Also consider human factors, such as the victim being uncooperative or an aggressor lurking in the vicinity.

Calling Emergency Medical Help

After assuring it is safe to approach:


Call out for by standers to help. Have them call 911 and get an AED if needed.
If no one responds:
Victim Breathing: Adult & Pediatric
If no one responds, call 911 yourself and get back to the victim quickly.
Victim Not Breathing
ADULT
Call 911 yourself, get an AED if nearby, and return to the victim quickly.
Victim Not Breathing
PEDIATRIC
or witnesessed
ASPHYXIA
Perform five cycles of CPR , about two minutes, then call 911 and get the AED, if it is nearby.

An exception to calling 911 when you are alone is if the victim is not breathing and collapsed due to asphyxia. Asphyxia is respiratory failure, which causes an extremely deficient supply of oxygen to the body, which makes the heart stop. Some common causes of asphyxia include drowning, choking and suffocation. If you have witnessed someone experiencing a cardiac arrest due to asphyxia, perform 5 cycles of CPR, then call 911 and get the AED if it is close by. Always assume that a non-breathing pediatric victim is suffering from asphyxia, so if you are alone, perform 5 cycles of CPR before calling 911.

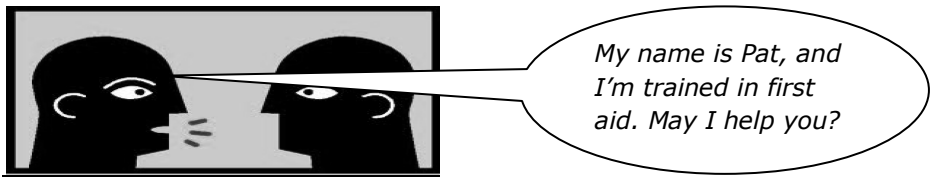
Consent

Permission must be given to the first-aid responder. A nod is acceptable. If the victim is unconscious or cannot understand you consent is assumed. It's called "implied consent." Tell the victim your name and ask if you can help.

When in doubt, assume consent.

Good Samaritan Law

Is a legal doctrine that protects a rescuer who has voluntarily helped a victim in distress from being successfully sued for "wrongdoing." Its purpose is to keep people from being reluctant to help a stranger in need for fear of legal repercussions. Good Samaritan laws vary by jurisdiction.



Assessment of the Victim

After ensuring the scene is safe, caring for the victim is divided into two stages. Primary Care Assessment, which deals with immediate life-threatening situations; and Secondary Care Assessment, which covers injuries and illnesses that are not immediately life-threatening.

Primary Care Assessment

- Responsiveness
- Breathing and cardio function
- Serious bleeding management
- Shock management
- Spinal injury management

If the patient is responsive, without immediate life-threatening situations, Perform a SAMPLE history.

Secondary Care Assessment

- Injury assessment
- Illness assessment
- Bandaging
- Splinting for dislocations and fractures

S Signs and symptoms
A Allergies
M Medicines
P Past medical history/pregnancy
L Last oral intake
E Events leading to the emergency

Bloodborne Pathogens

The actual risk of contracting an infectious disease when providing first aid is minimal. However, the rescuer should assume that all blood and bodily fluids are infected and protect themselves. Bloodborne pathogens are carried through the blood, and include hepatitis B and C viruses, and HIV infection.

Personal Protective Equipment includes clothing and equipment worn by an individual during activities which may result in exposure to bloodborne pathogens. These include gloves, gowns, face and eye masks.

Simple Triage

Is used in a scene of a "mass-casualty incident", such as a car accident or national disaster, in order to sort victims into those who need critical attention and immediate transport to the hospital, and those with less serious injuries. This step can be started before transportation becomes available and involves quickly assessing and prioritizing casualties into three categories:

Immediate Care: This designation is for casualties that need immediate care, and medical intervention would make a positive effect to their outcome.

Delayed Care: This group includes casualties that have no immediate life-threatening issues, but can't move on their own, for example a broken leg.

Dead/Non-Salvageable: These are the casualties that are found not breathing, and with obviously mortal injuries.

Adult CPR – onset of puberty and older.
Child CPR - age one through the onset of puberty.
Infant CPR - under the age of one.

Head-to-Toe Exam

Once the primary survey is complete and there are no immediate life-threatening situations, begin the secondary survey. Start with a head-to-toe examination. However, do not move a victim with a possible spinal injury. Falls, car or bicycle accidents, impact to the head or something heavy falling on the head can indicate spinal or neck damage.

Neck injuries are one of the most serious of all trauma incidents. Do not move the victim unless their environment is life-threatening. Due to displaced pain, a victim may not realize that he/she has even injured their neck. Attempting to get up, move or look around can then further complicate things. Therefore, it is imperative that upon arriving on scene, someone performs a "C-Spine" by placing their palms on either side of the victim's head and wrapping their fingers around the chin and neck of the victim. If conscious, the victim must be told to not attempt to move, especially the head. Rolled clothing may also be used to stabilize the head.

- Look at and feel the injured person's head and face, and note any abrasions, bruising or fluids in the nose or ears, depressions of the skull, or damage to the eyes. Are the pupils of equal size? Do the eyes follow movement? Are skin color and temperature normal? Is the skin dry or clammy?
- Look at and feel the neck for any tenderness bruising or deformity.
- Look at and feel the shoulders, collarbone, chest and abdomen. Note any asymmetries, tenderness or bruising.
- If no spinal injury is suspected, slide your hand carefully under the injured person and feel along the back and spine for any tenderness, bleeding or irregularities.
- Press on both of the protruding bones in the pelvis and see if there is any pain or deformity.
- Look and feel along the injured person's arms and legs for any bruising or deformity.
- Check the pulse in both wrists and at the top of each foot and see if the pulse is the same in each place.
- Scratch both hands and feet and ask the injured person if he or she can feel the sensation.
- Ask the injured person to move his or her arms, legs, fingers and toes, and check for a full range of motion.

Recovery Position

If you must leave a victim, place them in the modified HAINES recovery position to maintain an open airway in an unconscious patient with intact breathing and pulse.

What to do:

- Place the patient on their back.
- Lift the chin to ensure the airway is open.
- Extend the victim's arm nearest you above their head.
- Place patient's other arm across the chest, with back of their hand against the opposite cheek.

- Pull up the patient's knee joint (side away from you), as it bends keep the foot flat on the ground.
- Roll the patient in this position toward you.
- Tilt the patient's head back to ensure that the airway is open.
- The uppermost leg should be adjusted so that the hip and knee are at right angles.
- Seek immediate medical help.

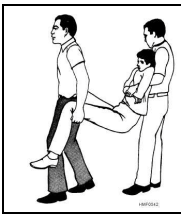
Don't move an injured person.
That is the general rule; however, sometimes there is a life-threatening risk to keep the patient where they are, and you must move them away from danger. Use extreme caution to further reduce the risk of injuring the person further. The biggest concern is for neck and spine injuries, which are often unnoticeable.

It is best to use a backboard and logroll the patient onto the backboard. Here are other moves if a backboard is not available.

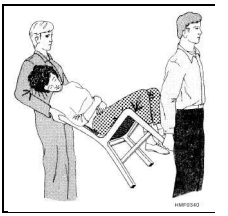
Blanket Drag

Shoulder Carry

Two-Man Carry



Chair Carry

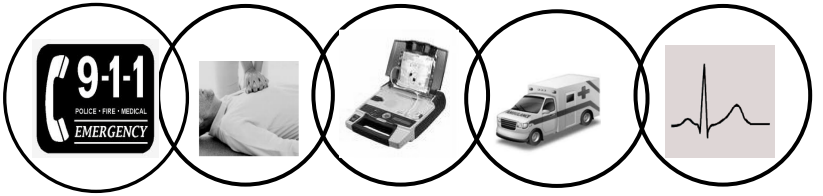


CPR – Cardiopulmonary Resuscitation

CPR is a lifesaving technique used when someone's breathing or heartbeat has stopped. In 2010, the American Heart Association updated its guidelines to recommend that everyone — untrained bystanders and medical personnel alike — begin CPR with chest compressions. The new mnemonic is called C-A–B, and stands for compressions, airway and breathing. Research suggests that if high-quality chest compressions are started right away, the likelihood of survival increases dramatically. Victims usually have enough residual oxygen in their systems, at least for the first few minutes after cardiac arrest, to reduce the need for artificial respiration.

The Chain of Survival

The chain of survival consists of 5 links that lead to a more successful resuscitation outcome.



1 **2** **3** **4** **5**

1. **911 Immediate recognition** of cardiac arrest and activation of the emergency response system (911). Know the warning signs and immediately call 911.
2. **Early CPR** with an emphasis on chest compressions. Start CPR with chest compressions to circulate blood until EMS arrives.
3. **Rapid defibrillation**. Use an AED as quickly as possible.
4. **Effective advanced life support**. EMS arrives and offers more advanced support for the victim, such as emergency oxygen and drug therapy.
5. **Integrated post-cardiac arrest care**. Research shows that integrated post-cardiac care can improve the likelihood of patient survival with good quality of life.

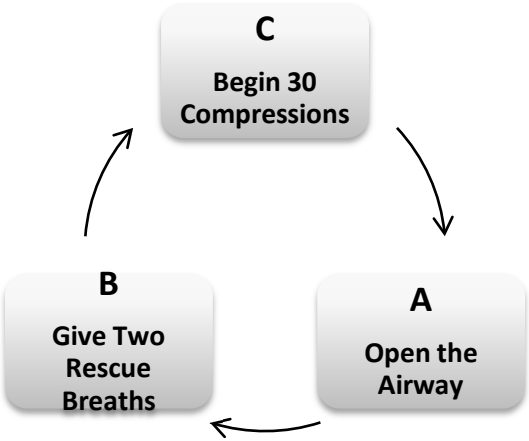
When to Start CPR

For any person, infant, child, or adult that is unresponsive; establish whether they are breathing regularly, or normally.

Normal breathing consists of regular movement of the chest, with the exhaled air being CLEARLY evident. With cardiac arrest victims there is a high likely hood of agonal, or erratic breathing. These reflex breathing actions make it confusing for rescuers who are not familiar with agonal breathing. They occur occasionally and sound like snorting, snoring and gurgling.

If you can't wake a person and aren't sure if they are breathing, they probably are not. If the victim is taking such shallow breaths that you can't see the chest rising and falling, it's not enough. If the victim is gasping every few seconds for air – called agonal breathing - it's not enough. Agonal breathing may sound like snoring, snorting, gurgling, moaning or noisy breathing.

For all ages – infant, children or adults – the sequence is the same with only slight variations. If there **is no breathing, or no normal breathing** such as gasping, start CPR using the **C-A-B.**



When an AED arrives, turn it on and follow the voice prompts. Minimize interruptions of CPR compressions.

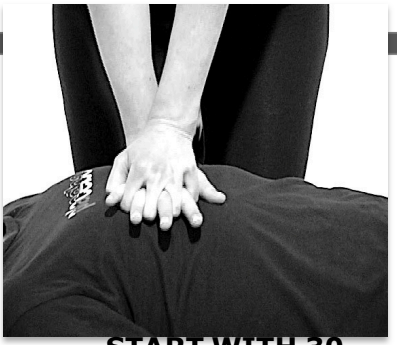
HIGH QUALITY CPR

- **Rate at least 100 compressions per minute.**
- **Compression depth at least 2 inches.**
- **Allow complete chest recoil after each compression.**
- **Minimize interruptions in chest compression.**
- **Avoid excessive ventilation.**

DO NOT STOP THIS CPR CYCLE UNLESS:

- **you are too exhausted to continue.**
- **the victim shows signs of responsiveness.**
- **an AED arrives.**
- **qualified help arrives and takes over.**

Adult CPR Landmarks



START WITH 30 COMPRESSIONS.

Kneel close to the victim.

Place the heel of your palm in the center of the victim's chest. Place your other hand on top of the first.

Position your shoulders directly over the wrist.

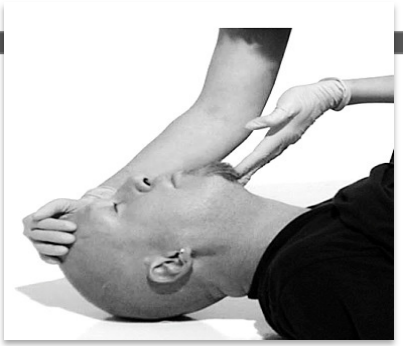
Lock your elbows.

PUSH HARD PUSH FAST

Push Hard. Compress the chest at least 2 inches in depth.

Push Fast. Compression's should be 100 - 120 beats per minutes.

Full Recoil of the Chest. Allow the chest to fully release.



OPEN THE AIRWAY

Place the palm of one hand on the victim's forehead.

The fingertips of the other hand should be placed on the bony part of the victim's chin.

Gently tilt the head back and perform a chin lift. This will open the airway and lift the tongue from the back of the throat.

BREATHE TWICE

Pinch the soft part of the victim's nose closed using your index finger and thumb.

Give the victim 2 breaths. Use your perphial vision to watch for the chest to rise and fall inbetween breaths. The 2 breaths should not take more than 5 seconds.

Watch for the chest to rise and fall inbetween breaths.

Take a normal breath and place your lips around their mouth, to make a good seal. Each breath should take about 1 second.

If the initial rescue breath does not make the chest rise, then recheck that there is adequate head tilt and chin lift.

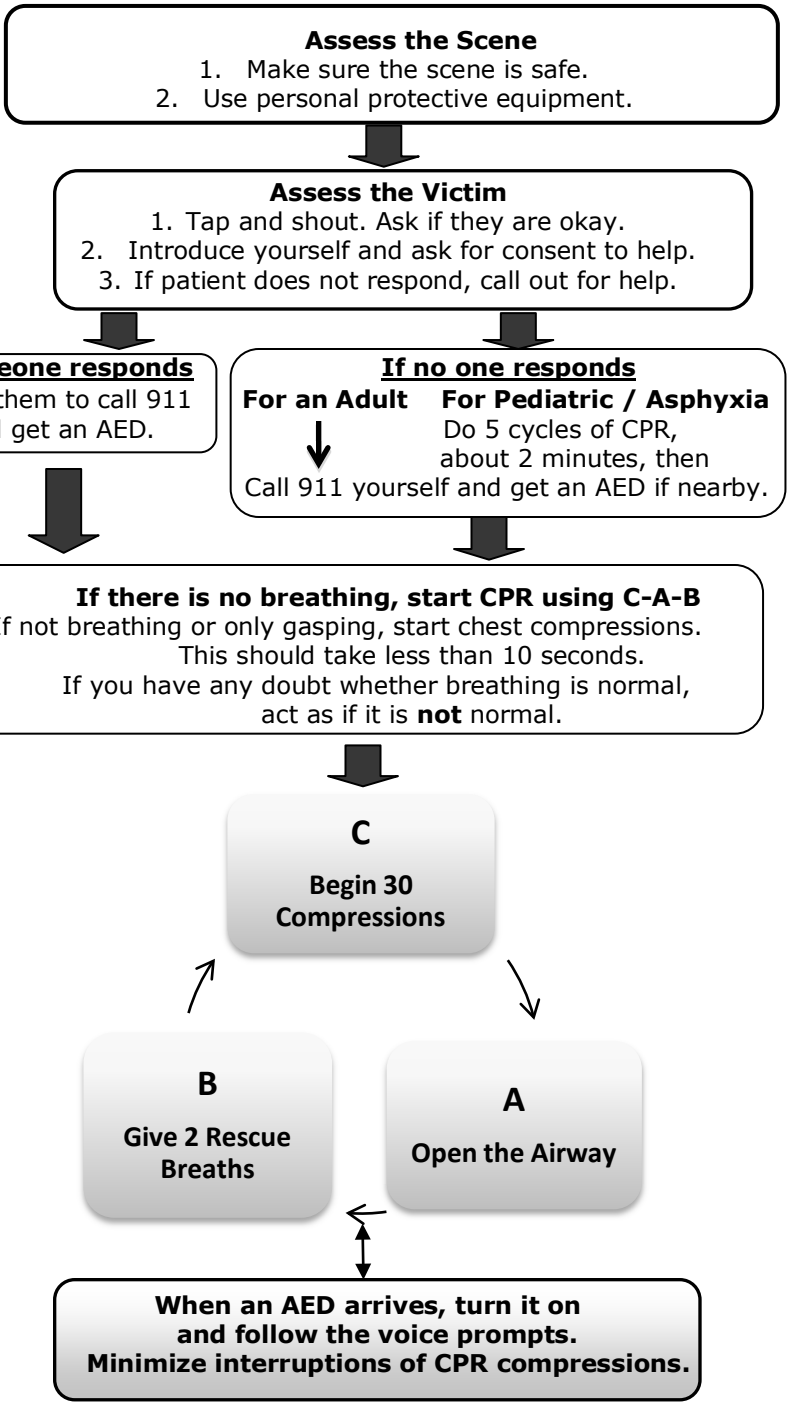
MINIMIZE INTERRUPTIONS TO COMPRESSIONS!

Do not attempt more than 2 rescue breaths before resuming compressions.

Use an AED as soon as it is available.

Minimize interuptions to chest compressions before and after each shock.

The CPR /AED Algorithm for Adult and Pediatric Victims


Assess the Scene
1. Make sure the scene is safe.
2. Use personal protective equipment.
Assess the Victim
1. Tap and shout. Ask if they are okay.
2. Introduce yourself and ask for consent to help.
3. If patient does not respond, call out for help.
If someone responds
Send them to call 911 and get an AED.
If no one responds
For an Adult
For Pediatric / Asphyxia
Do 5 cycles of CPR, about 2 minutes, then
Call 911 yourself and get an AED if nearby.
If there is no breathing, start CPR using C-A-B
If not breathing or only gasping, start chest compressions.
This should take less than 10 seconds.
If you have any doubt whether breathing is normal, act as if it is not normal.
C
Begin 30 Compressions
B
Give 2 Rescue Breaths
A
Open the Airway
When an AED arrives, turn it on and follow the voice prompts.
Minimize interruptions of CPR compressions.

START WITH 30 COMPRESSIONS.

Kneel close to the victim.

Place the heel of your palm in the center of the victim's chest. If you cannot compress the chest 2" then use two hands.

Position your shoulders directly over the wrist and lock your elbow.

PUSH HARD PUSH FAST

Push Hard. Compress the chest at least 2 inches in depth.

Push Fast. Compression's should be 100 - 120 beats per minutes.

Full Recoil of the Chest. Allow the chest to fully release.

OPEN THE AIRWAY

Place the palm of one hand on the victim's forehead.

The fingertips of the other hand should be placed on the bony part of the victim's chin.

Gently tilt the head back and perform a chin lift. This will open the airway and lift the tongue from the back of the throat.

Breathe twice.

Pinch the soft part of the victim's nose closed using your index finger and thumb.

Give the victim 2 breaths. Use your peripheral vision to watch for the chest to rise and fall between breaths. The two breaths should not take more than 5 seconds.

Watch for the chest to rise and fall inbetween breaths.

Take a normal breath and place your lips around their mouth, to make a good seal. Each breath should take about one second.

If the initial rescue breath does not make the chest rise, then recheck that there is adequate head tilt and chin lift.

Minimize interrupts to compressions!

Do not attempt more than 2 rescue breaths before resuming compressions.

Use an AED as soon as it is available.

Minimize chest interuptions to chest compressions before and after each shock.

Infant CPR Landmarks

Start with 30 compressions.

Tap the baby's foot to see if it is responsive.

A firm surface is needed to perform infant CPR. Do not try to hold the baby.

Place 2 fingers of one hand vertically, just below the nipple line, in the center of the chest.

PUSH HARD. PUSH FAST.

Push Hard. Compress 1/3 the anterior-posterior dimension of the chest, about 1-1/2 inches in depth.

Push Fast. Compressions should be at least 100 beats per minutes.

Full Recoil of the Chest. Allow the chest to fully release.

Open the airway.

Place the palm of one hand on the infant's forehead.

The fingertips of the other hand should be placed on the bony part of the victim's chin.

Gently tilt the head back and perfom a chin lift. Do not hyper-extend the infant's neck.

Breathe twice.

Cover the baby's mouth and nose with your mouth.

Give 2 puffs of air, about the amount you can hold in your cheeks. Each breath should take about 1 second.

Blow steadily and watch for the chest to rise, do not over inflate the lungs.

Watch for the chest to rise and fall in between breaths.

Take a normal breath and place your lips around their mouth, to make a good seal. Each breathe should take about one second.

If the initial rescue breath does not make the chest rise, then recheck that there is adequate head tilt and chin lift.

Minimize interrupts to compressions!

Do not attempt more than 2 rescue breaths before resuming compressions.

Use an AED as soon as it is available.

Minimize interuptions to chest compressions before and after each shock.

Foreign-Body Airway Obstruction for Adults and Children

Choking occurs when a foreign object becomes lodged in the throat or windpipe, blocking the flow of air. Because choking cuts off oxygen to the brain, choking can result in unconsciousness and cardiopulmonary arrest.

The universal sign for choking is hands clutched to the throat. If the person doesn't give the signal, look for these indications:

- Inability to talk
- Difficulty breathing or noisy breathing
- Inability to cough forcefully
- Skin, lips and nails turning blue or dusky
- Loss of consciousness

If you observe a "conscious" adult or child choking:

- **Ask the person**, "Are you choking?"
- **If they are coughing**, talking or breathing, DO NOT INTERFERE
- If they cannot speak or cough, initiate 911 and begin the Heimlich maneuver.
- **Stand behind the person and make a fist with one hand.** Position it slightly above the person's navel.
- **Grasp the fist with the other hand, encircling the waist.** Press hard into the abdomen with a quick, upward thrust.
- **Be persistent.** Continue uninterrupted until the obstruction is relieved, the person becomes unconscious, or more advanced medical personnel take over.

Universal Sign for Choking

If the person is coughing effectively do not interfere.

If they cannot make a noise, or just a high pitched wheeze, proceed with the Heimlich Maneuver.

The universal sign for choking is hands clutching the throat.

The Heimlich Maneuver is so successful that it is rare for a victim to go unconscious. If the victim does lose consciousness, lower them to the ground and start CPR with 30 compressions to circulate the oxygen that is in the blood stream.
If you see an object in the mouth while opening the airway, remove it, (step A in the C-A-B) but only put your finger in the mouth if you see something.

Thrust slightly above the navel.

Ask for consent to help.

Make a fist and place it slightly above the navel, thumb side inward.

Grasp the fist with the other hand. Press hard into the abdomen with a quick upward thrust.

Be Persistent !

Be Persistent! Continue uninterrupted until the obstruction is relieved, EMS arrives or the person becomes unconscious.

Start CPR if the victim becomes unconscious, starting with 30 compressions.

For Pregnant Victims

If you are unable to wrap your arms around the victim, of if they are pregnant, position your hands higher at the base of the breastbone, just above the joining of the lowest ribs.

Conscious Infant Choking Procedure (under 1 year of age):

- **If they are coughing, do not interfere.**
- If they cannot make a sound initiate 911 and begin the treatment for infant choking.
- **Hold the infant face-down** on your forearm, in a sitting position, with the arm resting on your thigh. The baby's head should be lower than the heart.
- **Thump the infant gently but firmly** 5 times on the middle of the back, between the shoulder blades use the heel of your hand.
- **Hold the infant face-up on your forearm** with the head lower than the heart. Using 2 fingers placed at the center of the infant's breastbone, give 5 quick chest compressions, 1 ½ inches in depth.

Deliver 5 back blows.

Hold the infant face down on your forearm, with the arm resting on your thigh. Support the head and neck. Position the baby's head lower than the heart.

Give 5 firm thumps with the heel of your hand between the baby's shoulder blades.

Deliver 5 chest thrusts.

Gently turn the infant face-up on your forearm.

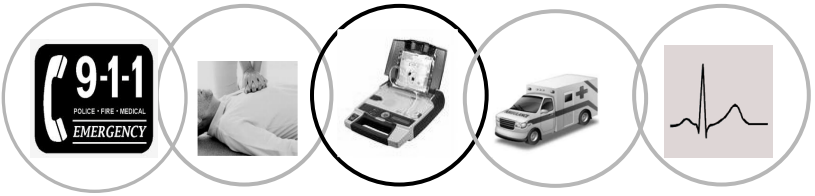
Using 2 fingers placed at the center of the infant's breast, give five quick compressions, about 1- 1/2 inches in depth

Continue this cycle until the object is releived or the baby becomes unconscious.

- **Repeat the back blows and chest thrusts.**
- **Repeat** until the baby has an open airway, EMS arrives or the baby becomes unconscious.
- **If the baby becomes unconscious began infant CPR.**

AED, the Automated External Defibrillator

The AED is 3rd step in the chain of survival and can greatly increase the victim's chance of survival. AEDs, (Automatic External Defibrillators), are computerized, portable devices that can help prevent death due to sudden cardiac arrest. When used within the first three to five minutes of a person collapsing, these devices have been shown to dramatically increase the survival rate of people who suffering from sudden cardiac arrest. The victim's chance of survival decreases with longer intervals between the arrest and defibrillation.



1 2 **3** 4 5

The AED diagnoses the cardiac rhythms of the victim, then detects if the heart can benefit from an electrical shock. If it detects a shockable rhythm, it administers an electrical shock in order to enable the heart to reestablish a normal heart rhythm.

Each day about 600 people die in the U.S. of sudden cardiac arrest. The placement of AEDs in work, government and community centers has increased the public's access to defibrillation. Public Access to Defibrillation (PAD) has made this important link in the chain of survival more available.

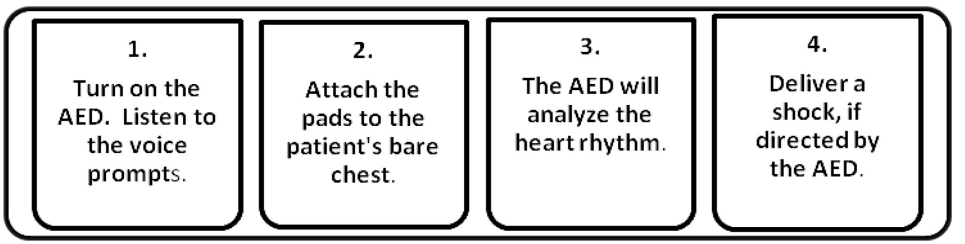
How AEDs Work

Cardiac arrest usually occurs when your heart's electrical activity becomes disrupted and the heartbeat gets dangerously fast (ventricular tachycardia) or chaotic (ventricular fibrillation, v-fib). Because of this chaotic, irregular heart rhythm (arrhythmia), your heart stops beating effectively and can't adequately pump blood. This is the most common initial rhythm of sudden cardiac arrest. The heart needs to be shocked back into a normal rhythm, which is where an AED comes into play. An AED stops the heart from its spasm by delivering a shock to the heart. This allows the nerve impulses a chance to return to the normal pattern, which allows the heart to resume beating at its normal pace.

Examples of different AEDs.
The only treatment for v–fib is defibrillation as soon as possible. In an emergency, the AED essentially makes the decisions and directs the rescuer's efforts. AEDs offer step-by-step voice instructions to guide a user through the defibrillation process. Stay calm and follow the directions given by the AED.

AEDs are easy to use and require minimal training. While there are several different brands of AEDs, but they all utilize four basic steps:

- **Turn on the AED** and listen to the voice prompts.
- **Attach the AED pads** to the victim's bare chest.
- **The AED will analyze** the heart rhythm automatically.
- **Deliver a shock,** if directed to by the AED.


1.
Turn on the AED. Listen to the voice prompts.
2.
Attach the pads to the patient's bare chest.
3.
The AED will analyze the heart rhythm.
4.
Deliver a shock, if directed by the AED.

AEDs Have Many Common Features

But they do vary by manufacturer. Become familiar with the type of AED in your facility. Most AEDs have:

- Power on /off button.
- Shock button.
- Battery status indicator.
- A simple drawing indicating pad placement on the patient's chest.
- Micro computers that analyze a patient's heart rhythm.
- Visual / audio prompts guide the user through the CPR & AED steps.
- Recording of the interaction between the rescuer and the patient.

AEDs also have common voice prompts. Some common phrases you'll hear:

- Analyzing Rhythm
- Charging
- Stand Clear
- Do Not Touch the Patient
- Press the Shock Button
- Shock Delivered
- Check Electrode Connection
- Start CPR with 30 Chest Compressions

Integrating CPR and AED's

Give the victim the best chance of survival. If the rescuer is not trained in CPR, perform chest compressions only. The number of chest compressions delivered per minute during CPR is an important determinant in return of spontaneous circulation. When an AED is used in combination with effective CPR, many more lives are saved then with CPR or an AED alone. It is estimated by the American Heart Association that over 50,000 lives could be saved each year by early use of an AED combined with prompt bystander CPR.

Attach and use AED as soon as available. Minimize interruptions in giving chest compressions before and after shock is received; resume CPR beginning with compressions immediately after each shock.

The CPR /AED Algorithm for Adult and Pediatric Victims

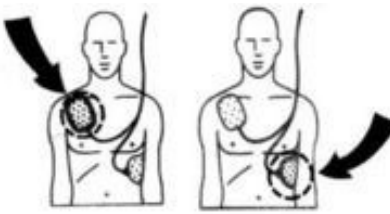
Review the Algorithm for CPR and AED on Page 10 and note the important facts.

1. **Attach and use the AED as soon as it is available.**
2. **Follow the voice prompts on the AED.**
3. **Minimize interruptions to chest compressions before and after each AED analysis.**
4. **If you are alone call 911 one first and then start CPR, unless the victim is a pediatric victim, or suffering from asphyxia. If they are suspected asphyxia patients perform 5 cycles of CPR and then get the AED yourself.**

How to Use an AED

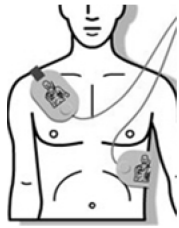
The 2010 guidelines state that when any rescuer witnesses an out-of-hospital arrest and an AED is immediately available on-site, the rescuer should start CPR with chest compressions and use the AED as soon as possible. While using the AED, **minimize CPR interruptions**.

- Always ensure that CPR is being provided for the victim unless the AED machine is actively analyzing or shocking the victim.
- Place the AED next to the victim's head and turn it on.
- There will be voice prompts to coach you on the specific steps of operation for the Automatic External Defibrillator.
- Remove the defibrillation pads from their packaging. Look at the pictures on the pads to see exactly how to place them.



- Ensure that the adhesive AED pads are attached to a cable, which is plugged into the AED machine.

- Remove the self-adhesive backing and attach the electrodes to the victim's bare chest.
- Typically the negative pad is placed on the victim's right upper chest wall (above the nipple and to the right of the sternum). The positive electrode is placed on the victim's left chest/side below the nipple and pectoral.



- Attach the electrodes firmly to the skin.
- The AED will indicate, "do not touch the patient."
- The AED will begin to automatically analyze the victim's heart rhythm when the electrodes are correctly placed.
- Ensure that no one, including you, is touching the victim while the AED is analyzing.
- If an AED indicates a shock is advised, the AED will charge automatically and direct you to push the "shock" button. Some models inform you that it is going to shock.
- Ensure, again, that no one is touching the victim and call out "CLEAR."
- Listen for the voice prompts from the AED. If it states start CPR, begin immediately with chest compressions.
- Continue to listen to the voice prompts from the AED. Every few minutes you will be prompted to stop CPR so the AED can re-analyze the victim's heart rhythm.

- Do not stop CPR unless the victim becomes responsive, EMS tells you they will take over, or you are too exhausted to continue.
- Do not remove the electrode pads for CPR; continue with the pads in place.
- Do not remove the pads if the victim becomes responsive. Leave them on until EMS arrives.

The earlier that defibrillation occurs, the better. For every minute that defibrillation is delayed on a person suffering from ventricular fibrillation, their chance of survival declines by 7% to 10%.

Pediatric Cardiac Arrest Victims:

The most common cause of primary cardiac arrest is asphyxia. Asphyxia is respiratory failure, which causes an extremely deficient supply of oxygen to the body. Asphyxia occurs in drowning, choking, and in other circumstances that cause obstruction to the airway and prevent the intake of oxygen.

Because the most likely cause of cardiac arrest in infants and children is asphyxia, the CPR /AED algorithm will be slightly modified for the lone rescuer. If there are two rescuers, the algorithm remains the same: one should start CPR immediately, and the other should activate the emergency response system and obtain an AED, if one is available.

The rescuer should assume that a pediatric patient is in asphxyial arrest. For a presumed asphyxial arrest, the priority is to provide chest compressions with rescue breathing for about 5 cycles (approximately 2 minutes) before activating the emergency response system and obtaining an AED, if one is nearby. The lone rescuer should return to the victim as soon as possible and use the AED, if available, and continue CPR starting with chest compressions.

Using an AED on Children:

From the ages one to the unset of puberty, the rescuer should use a pediatric dose-attenuator system, if one is available. An attenuator is an electronic device that reduces the amplitude or power of signal without distorting the waveform. If the rescuer provides CPR to a child in cardiac arrest and does not have an AED with a pediatric dose-attenuator system, the rescuer should use a standard AED.

Using an AED on Infants:

For infants up to one year old, a manual defibrillator is preferred. If a manual defibrillator is not available, an AED with pediatric dose attenuation is desirable. If neither is available, an AED without a dose attenuator may be used.

Pediatric Pad Placement

Pad placement for child can be the same as an adult, but make sure the pads are not touching. If the pads risk touching each other on a child, place one pad in the middle of the chest, and the other pad on the middle of the back, between the shoulder blades.

Pad placement for an infant is one pad on the middle of the chest and the other pad in the middle of the back, between the shoulder blades.

AED Precautions:

Certain circumstances require caution. To ensure that the AED & Pads work effectively, check the following:

- **Water can** be a conductor for electricity. Before performing the defibrillation, make sure the victim is not in a puddle of water. If the

victim is in contact with water, take them to a safe area and dry the chest before attaching the electrode pads. Sweat or water spots will also interfere with the performance of an AED and could lead to local burns. Completely dry off the chest. The AED kit will have a cloth for this purpose.

- **Nitroglycerine patches** on the chest, or any other patches, must be removed from the victim's chest before using the AED. Place the edge of the pads at least one inch away from any implanted device.
- **Sheet metal**, or other conductive surfaces such as bleachers, can be a hazard. Remove the victim from such surfaces.
- **If chest hair** is so excessive that it impedes a good adhesion of the pad to the skin, the hair must quickly be removed. Your AED kit has a razor for this reason. Remove the pads, ripping out the hair, and apply a new set of pads.
- **Internal Pacemakers** are implanted in some individuals to help regulate their heartbeat. When an AED is needed, electrode pads shouldn't be placed over the area of an implanted device. , If an implanted device exists, a rescuer will feel a small lump the size of a cell phone.

AED supplies should include:

- **An extra battery**
- **Two sets of electrodes**
- **Scissors**
- **Personal protection equipment**
- **Razor**
- **Hand towel**

AED Maintenance Programs:

Maintenance programs vary by manufacturer, depending largely upon the level of self-tests the AED automatically performs. Consult your AED manufacturer and the unit's user manual for complete details.
Periodic inspection can ensure that the AED is working properly and has the appropriate supplies ready. AEDs all run a series of self-tests. Common items checked during an AED self-test include:

- Battery level and usage since last reset.
- Defibrillation electrodes properly connected.
- ECG signal acquisition and processing circuitry is functional.
- Defibrillator charge and discharge circuitry is functional.
- Microprocessor hardware and software are functional.
- CPR monitoring circuitry and compression depth sensor are functional.
- Audio output circuitry is functional (if applicable).
- Testing of display screen (if present).

The AED can stay in its casing for the self-test.

Policy and Procedure Suggestions

What do you need to do to make your lay-rescuer AED program as effective as possible? According to the American Heart Association guidelines, attention to the following elements will help:

- Identify a qualified healthcare provider to provide program oversight.
- Develop, practice and follow a written response plan.
- Identify and train likely rescuers, taking into account the need for refresher training and rescuer turnover.
- Remember that SCA victims may need CPR, treatment with an AED or both, so rescuers should be prepared to not only to use the AED but also to provide quality CPR.
- Be sure the program is integrated with the local EMS system.
- Develop and implement a process of ongoing quality improvements that feature routine inspections of AED devices and electrodes evaluation.
- Have a plan for post-event data including response-plan effectiveness, rescuer performance and AED function.

AED Troubleshooting

Occasionally, there may be an error by the rescuer, for example, not applying the pads correctly. If this happens, STAY CALM and listen to the voice prompts. AEDs are programmed to let you know when there is an error. Some voice-prompt examples include:

"**Check Pad Connection."** If this is indicated:

- Look at the picture diagram and make sure the pads are placed correctly.
- Make sure the cable is plugged in snuggly.
- Press the pads firmly against the chest.
- If the AED continues to indicate a pad problem, remove the pads and check for water on the chest or excess hair. Dry the chest and remove excess hair.
- Apply a new set of pads, if the prompt continues.

"Motion Detected." If this is indicated:

- Make sure CPR has been stopped.
- Assure that the cables are motionless.

"Low Battery." If this is indicated:
The battery is low and needs to be replaced.

"Plug on Cable." If this is indicated:
Ensure that the electrode cable is properly plugged into the machine. Switch pads if prompt continues.

" No Shock Delivered." If this is indicated:
The shock button was not pressed. When prompted to press the button, do so within 30 seconds.

Downloading Event Data:

While using an AED, the device is recording the events. Most AED's have a minimum of 15 minutes recording time. Typically they record the ECG data,

and some also record audible sounds. This information needs to be downloaded. Consult your manual or call your AED service company for downloading information.

After the AED has been used, perform a maintenance inspection and battery test. Ensure that new pads and other supplies are replaced. Consult your AED manual for manufacturer specific requirements or call your AED service company.

After using an AED:

The following information should be compiled; sample forms are available from the AED manufacturer or your AED service company.

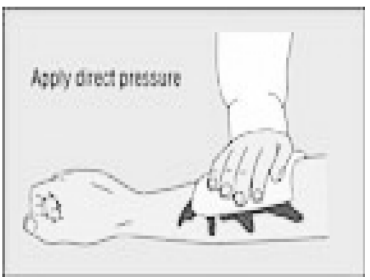
1. Name of AED device.
2. Serial number of AED.
3. Date:
4. Patient Information such as: Name, Address, Age, Gender.
5. Site of Incident:
6. Witnessed Arrest? Yes No
7. Breathing upon arrival of Designated responders? Yes No
8. Bystander CPR? Yes No
9. Cardiac Arrest after Arrival? Yes No
10. Number of Defibrillations:
11. Efforts terminated in the field? Yes No
12. Any complications? Yes No
13. Comments:
14. Additional Comments:
15. Rescuer's Name:
16. Rescuer's Signature:

Wound Care

Severe Bleeding:

Severe bleeding is frequently the most serious risk to an injured person's life. If you have found severe bleeding during the primary survey, treat the patient using the following steps, utilizing your personal protection equipment.

- **Apply pressure directly on the wound until the bleeding stops.**
- Use a sterile bandage or clean cloth and hold continuous pressure.
- **Maintain firm** pressure for 10-15 minutes. If the flow of blood increases when you release pressure, repeat. Use your hands if nothing else is available. If possible, wear rubber or latex gloves or use a clean plastic bag for protection.



- **Don't remove the gauze or bandage.** If the bleeding continues and seeps through the gauze or other material you are holding on the wound, don't remove it. Instead, add more absorbent material on top.
- If you cannot apply continuous manual pressure, wrap an elastic bandage firmly over gauze to hold it in place with pressure bandage.
- **Tie the knot** of the bandage over the wound.
- **Immobilize the injured body part once the bleeding has stopped.** Leave the bandages in place and get the injured person to the emergency room as soon as possible.
- **Specifically designed tourniquets** should be only used with proper training (class IIa). If a tourniquet is used, make sure that you note the time it was applied and relay that to EMS.

Treatment for Minor Wounds:

- Have the person sit down if they feel weak.
- Thoroughly irrigate and clean the area with soap and water to remove any dirt or debris, and lower risk of infection.
- Apply light pressure to the area with sterile gauze to help with blotting. Bleeding should stop after 5 - 8 minutes for a minor cut.
- Allow the wound to air-dry before you apply a sterile adhesive bandage.
- Apply antibiotic cream if there are no known patient allergies.
- If the wound is from a bite, or if the wound was dirty make sure the victim has had a tetanus shot.
- See a physician if the wound becomes swollen or irritated, or if the skin around it turns warm or red. The wound may be infected.

Infection Risks

Even minor cuts and scrapes can cause an infection. Be sure to clean all wounds and apply an antibiotic cream. Cover the wound with sterile dressing to help discourage infection.

Amputations:

By responding quickly to an amputation, there is a good chance that the severed body part can be reattached.

- Call 9-1-1.
- Control bleeding by using direct pressure on the wound.
- Wrap and bandage the wound to prevent infection.
- If bleeding is significant, give care to minimize shock.
- Wrap the severed body part in sterile gauze or a clean cloth.
- Place the severed body part in a plastic bag.
- Put plastic bag on ice (but do not freeze it).
- Be sure the body part is transported to the hospital.

If the body part is still attached, do not damage the connection. Wrap the wound with dressing and keep it cool.

Chest Injuries:

Chest injuries result from a blunt force to the chest area, damaging the ribs; or a penetration to the chest and possibly lungs, such as an impaled stick, or gun or knife wound.

A blunt force usually damages ribs. The patient may have shallow breathing or sharp pain while breathing or coughing.

Treatment for ribs: Have the victim sit in the position they find most comfortable and support the area with a pillow, rolled blanket or other soft material. Contact EMS.

If a chest injury victim is conscious, have them sit in a comfortable position or lay on the injured side. This will prevent blood seeping into the chest of the uninjured side.

A penetration to the chest area may occur by an impaled stick. Do not remove the object, as this will cause further damage. A hole that pulls air into the chest cavity is called a sucking chest wound.

Treating an impaled object

- Do not remove the object.
- Call 9-1-1.
- If the victim must be moved, shorten the length of the object if possible.
- Stabilize the object.

Treating a sucking chest wound

- Call 9-1-1.
- Seal the wound with plastic or non-porous flexible material, 2" larger than the wound. Tape the top and sides, leaving the bottom open.

WHEN ARE STITCHES NEEDED?

Possibly when:

- The edges of the skin do not fall together.
- The wound is over 1" long.
- The laceration involves the face.
- The wound is near a joint.

After 8-12 hours, the wound is unlikely to be stitched.

Eye Injury

For objects embedded in the eye:

- Do not attempt to remove an object embedded in the eye.
- Protect the eye from further damage by stabilizing a long protruding object with clean dressings. For smaller protrusions, place a paper cup over the eye and secure in place with clean bandages.
- Bandage loosely and do not put pressure on the injured eye/eyeball.
- Cover both eyes to limit movement as the eyes move together.

For small foreign bodies in the eye (such as sand or other debris):

- Have the person blink several times to try to remove the object.
- Gently flush the eye with water.

Puncture wounds:

Puncture wounds don't usually cause excessive bleeding, but can be dangerous because of the risk of infection.

- **Stop the bleeding** with direct pressure.
- **Clean the wound** with clear water and soap. Rinse well.
- **Apply an antibiotic.**
- **Cover the wound.**
- **Watch for signs of infection.** See a doctor if the wound doesn't heal or if it has redness, drainage, warmth or swelling.

Internal Bleeding

Call 911 if you suspect internal bleeding. Signs of internal bleeding may include:

- Bleeding from body cavities, such as the ears, nose, rectum or vagina.
- Vomiting or coughing up blood.
- Bruising on the neck, chest, abdomen or side (between ribs and hip).
- Wounds that have penetrated the skull, chest or abdomen.
- Abdominal tenderness, possibly accompanied by rigidity or spasm of abdominal muscles.
- Fractures .
- Shock, indicated by weakness, anxiety, thirst or skin that's cool to the touch.

NOSE BLEEDS

- Have the person sit leaning slightly forward. This will keep the blood from going to the back of the throat and causing choking or vomiting.
- Pinch the nostrils together for about 10 minutes.
- To prevent re-bleeding after bleeding has stopped, don't pick or blow the nose. and don't bend down until several hours after the bleeding episode. Keep the head higher than the level of the heart.

Shock

Shock may result from any traumatic injury or traumatic illness. When a person is in shock, their organs aren't getting enough blood or oxygen, which if untreated, can lead to permanent organ damage or death.

Many illnesses and injuries could result in shock, therefore the use of oxygen is recommended.

Signs and symptoms of a person experiencing shock:

- **The skin is cool and clammy.** It may appear pale or gray.
- **The pulse is weak and rapid.** Blood pressure is below normal.
- **Breathing** may be slow and shallow, or hyperventilation (rapid or deep breathing) may occur. Person may be anxious.
- **The person may be nauseated.** He or she may vomit.

- **The eyes lack luster and may seem to stare.** Sometimes the pupils are dilated.
- **The person may be conscious or unconscious.** If conscious, the person may feel faint or be very weak or confused.

Treatment for Shock:

- Have the person lie down on his or her back.
- Call 911 or your local emergency number.
- Keep the patient warm and comfortable. Cover the person with a blanket.
- Raise feet 6"-12", provided patient has not suffered neck or back injury.
- Administer emergency oxygen.

Standard First Aid

Allergic Reaction (anaphylaxis)

Allergic reactions can be life threatening. In people who have an allergy, anaphylaxis can occur minutes after exposure to a specific allergy-causing substance. In some cases, there may be a delayed reaction or anaphylaxis may occur without an apparent trigger**.**

Signs and symptoms of anaphylaxis include:

- Skin reactions including hives, itching, and flushed or pale skin.
- Swelling of the face, eyes, lips or throat.
- Constriction of the airways, wheezing and trouble breathing.
- A weak and rapid pulse.
- Nausea.
- Dizziness, fainting or unconsciousness.

If you've had any kind of severe allergic reaction in the past, ask your doctor if you should be prescribed an epinephrine auto injector to carry with you.

Treatment:

- Immediately call EMS or 911.
- Ask the person if they are carrying an epinephrine auto injector.
- Assist the victim with the epinephrine injection from a prescribed auto-injector.
- Have the person lie still on their back.
- Loosen tight clothing and cover the person with a blanket. Don't give the person anything to drink.
- If medical help is delayed you may assist the patient with a 2nd injection for an epinephrine injection from a prescribed auto-injector.
- If there's vomiting or bleeding from the mouth, turn the person on his or her side to prevent choking.
- If there are no signs of breathing, coughing or movement, begin CPR and continue until EMS arrives.
- The results from an auto injector may only last a short time.

- Continue to monitor the victim for responsiveness.

Using an auto injector:

- Remove safety cap.
- Victim should place the black tip on their outer thigh.
- Push the auto injector firmly against the thigh and hold for 5 seconds.
- Discard of the auto injector properly.

Get emergency treatment even if symptoms start to improve. After anaphylaxis, it's possible for symptoms to recur. Monitoring in a hospital setting for several hours is usually necessary**.**

Asthma

During an asthma attack, the muscles of the lower airways go into spasm and constrict, thus narrowing the airway and reducing the flow of oxygen into the lungs. In addition "mucus plugs" form in the lower airways, further inhibiting the ability of the body to oxygenate the blood.

Signs & Symptoms:

- Difficulty in breathing - especially exhaling.
- Wheezing as they breathe.
- Tightness of the chest.
- Difficulty in talking.
- Distress and anxiety.
- A dry, unproductive cough.
- Possible loss of consciousness.

Treatment:

- Continually assess the victim's circulation and airway.
- Sit them down, ideally leaning slightly forward.
- Loosen tight clothing.
- The victim should be encouraged to self-medicate with their asthma-relief medication. This medication should relieve the symptoms of the attack within a few minutes. If there is no relief, allow them to self-medicate again.
- **The rescuer may help** the victim with he victim's prescribed bronchodilator medication if they state they are having an attack.

An ambulance should be called in the following circumstances:

- The medication is not working after five minutes.
- The condition is getting worse
- Talking is becoming more difficult.
- They start to become exhausted.
- If you are at all unsure of the patient's status.

<u>Human and animal bites</u> have similar treatment.

- **Treatment for bites** that break the skin:
- **Irrigate the bite** with copious amounts of water. This has been shown to prevent rabies and bacterial infection from animal bites.
- **Stop the bleeding** by applying pressure.
- **Apply an antibiotic cream** to prevent infection.
- **Apply a clean bandage.** If the bite is bleeding, apply pressure directly on the wound, using a sterile cloth until the bleeding stops.
- **Seek emergency medical care.** If you haven't had a tetanus shot within five years, your doctor may recommend a booster. In this case, you should have the booster within 48 hours of the injury.
- **For minor wounds.** If the bite barely breaks the skin and there is no danger of rabies, treat it as a minor wound.
- **For deep wounds.** If the animal bite creates a deep puncture of the skin or the skin is badly torn and bleeding, apply pressure with a clean, dry cloth to stop the bleeding and see your doctor.
- **For infection.** If you notice signs of infection, such as swelling, redness, increased pain or oozing, see your doctor immediately.

<u>Spider bites:</u> Only two spiders in the United States are considered a threat to human life, the Brown Recluse and Black Widow Spider. Although serious, a black widow bite is rarely lethal.

Black Widow Signs and symptoms include:

- The bite may feel like a pinprick or it may not be noticed.
- Initially you may have slight swelling and bite marks.
- Within a few hours stiffness and intense pain may begin.
- Fever, Nausea and vomiting.
- Severe abdominal pain.

Brown Recluse Signs and symptoms:

- Swelling with possible painful.
- Blister may develop.
- A wound that turns into an ulcer.

Treatment for Spider Bites:

- Cleanse the wound.
- Apply ice to reduce pain.
- Seek medical attention.

The reddish hourglass shape on the abdomen identifies black widows.

Brown Recluse spiders have a dark violin shaped area on their body

<u>Insect bites</u>:
Signs and symptoms of an insect bite result from the injection of venom or other substances into your skin.

Treatment for Severe Insect Bites.
Signs, symptoms and treatments of a severe insect bite are the same as an allergic reaction. For milder reactions:

- Move to a safe area to avoid more stings.
- Remove the stinger, especially if it's stuck in your skin. This will prevent the release of more venom. Wash area with soap and water.
- Apply a cold pack or cloth filled with ice to reduce pain and swelling.
- Apply hydrocortisone cream.
- Take an antihistamine containing diphenhydramine.

Bites from bees, wasps, hornets, yellow jackets and fire ants are the most troublesome. Bites from mosquitoes, ticks, biting flies and some spiders also can cause reactions, but generally milder. Although rare, some insects also carry disease such as West Nile virus or Lyme disease.

Snake Bites
React quickly to bites; North America is home to several types of venomous snakes. The most common is the rattlesnake, copperhead, cottonmouths and coral snakes.

- **Call 911 immediately!**
- **Do not elevate**. Keep the bite below the level of the heart.
- **Wash the area** with warm water and soap.
- **Remove constricting** clothing and jewelry from the extremity.
- The area may swell and constricting items will cause tissue death.
- **Continue to keep** the bite lower than the heart.
- **For venomous snake bites** apply a pressure immobilization bandage with pressure applied around the entire length of the bitten extremity.
- **Bring the dead** snake, if possible, to the hospital.
- ***Do not cut or suck into the snakebite.***

Jellyfish Stings
Treating jellyfish stings will help to prevent further nematocyst discharge and with pain relief.

- Wash liberally with vinegar for at least 30 seconds.
- ACT QUICKLY!
- If vinegar is not available, a baking soda slurry may be used.
- For the treatment of pain treat with hot-water immersion when possible. The victim should be instructed to take a hot shower or immerse the affected part in hot water, as soon as possible, for at least 20 minutes or for as long as pain persists.

Scorpion stings
Most scorpion stings are harmless only the bark scorpion, has venom potent enough to cause severe symptoms.

- Seek immediate medical care for any child stung by a scorpion.
- If you've been stung, get prompt care if you begin to experience widespread symptoms.

- If you're concerned about a scorpion sting — even if your reaction is minor — call your local poison control center for advice.

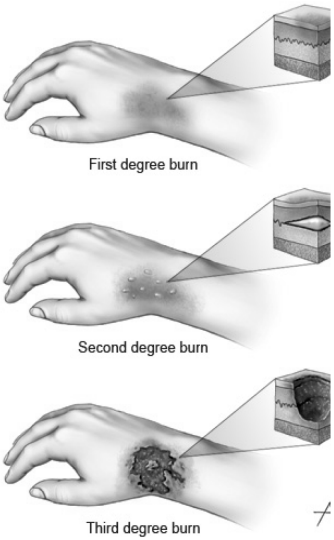
Types of Burns

Thermal burns can be caused by flames, contact with a hot object, liquids or steam; basically any exposure to heat that damages the skin. This can cause first-, second- or third degree burns.

Chemical burns are typically cause by strong acids, alkalis or other corrosive materials. Reactions to chemicals can be localized or effect the whole body.

Electrical burns can cause injury to the skin or internal organs, they occur when contact is made with exposure to an electric current. Electrical burns may look minor, but there may be extensive internal damage.

Degrees of Burns To distinguish a minor burn from a serious burn, the first step is to determine the extent of damage to body tissues. The three burn classifications of first-degree burn, second-degree burn and third-degree burn will help you determine emergency care:
If hot water is not available, dry hot packs or, as a second choice, dry cold packs may be helpful in decreasing pain.



Don't use ice.
Don't apply ointments until the burn has cooled.
Don't break blisters.

First-degree burn: The least serious burns are those in which only the outer layer of skin is burned. The skin is usually red, with swelling, and pain sometimes is present. Treat a first-degree burn as a minor burn unless it involves substantial portions of the hands, feet, face, groin or buttocks, or a major joint, which requires emergency medical attention.
Second-degree burn: When the first and the second layer of skin has been burned. Blisters develop and the skin takes on an intensely reddened, splotchy appearance. Second-degree burns produce severe pain and swelling. If the second-degree burn is no larger than 3 inches in diameter, treat it as a minor burn. If the burned area is larger or if the burn is on the hands, feet, face, groin or buttocks, or over a major joint, treat it as a major burn and get medical help immediately.
Third-degree burn: The most serious burns involve layers of the skin and cause permanent tissue damage. Fat, muscle and even bone may be affected. Areas may be charred black or appear dry and white.

Treatment

Minor burns, including first-degree burns and second-degree burns limited to an area no larger than 3 inches (7.6 centimeters) in diameter, take the following action:

- **Cool the burn.** Hold the burned area under cold (60°-75°) running water until the pain subsides, typically 10 to 20 minutes. If this is impractical, immerse the burn in cool water or cool it with cold compresses. Don't put ice on the burn.
- **Cover the burn with a sterile gauze bandage.** Don't use fluffy cotton, or other material that may get lint in the wound. Wrap the gauze loosely to avoid putting pressure on burned skin. Bandaging keeps air off the burn, reduces pain and protects blistered skin.
- **Take an over-the-counter pain reliever.** These include aspirin, ibuprofen or acetaminophen. Use caution when giving aspirin to children or teenagers.

Large Second-degree burns may need to be treated for shock.

Third-degree burns: The most serious burns involve all layers of the skin and cause permanent tissue damage. Fat, muscle and even bone may be affected. Areas may be charred black or appear dry and white. Difficulty inhaling and exhaling, carbon monoxide poisoning, or other toxic effects may occur if smoke inhalation accompanies the burn.

For major burns call 911 or emergency medical help. Until an emergency unit arrives, follow these steps:

- **Don't remove burned clothing.** However, do make sure the victim is no longer in contact with smoldering materials or exposed to smoke or heat.
- **Don't immerse large severe burns in cold water.** Doing so could cause a drop in body temperature (hypothermia) and deterioration of blood pressure and circulation (shock).
- **Check for signs of circulation (breathing, coughing or movement).** If there is no breathing begin CPR.
- **Elevate the burned body part or parts.** Raise the limb above the heart level, when possible.
- **Cover the area of the burn.** Use a cool, moist, sterile bandage; clean, moist cloth; or moist towels.
- **Care for Shock.**

Burn Blisters

Loosely cover burn blisters with a sterile dressing but leave blisters intact because this improves healing and reduces pain.

Electrical Burns

An electrical burn may appear minor or not show on the skin at all, but the damage can extend deep into the tissues beneath your skin. If a strong electrical current passes through your body, internal damage, such cardiac arrest or respiratory arrest, can occur. Thermal burns can be present at the entry and exit site as well as the pathway. Sometimes the jolt associated with the electrical burn can cause you to be thrown or to fall, resulting in fractures or other associated injuries.

Treatment:

- **Call 911**
- **Look first. Don't touch.** A person may still be in contact with the electrical source. Touching the person may pass the current through you.
- **Turn off the source of electricity if possible.** All materials conduct electricity if the voltage is high enough, so do not enter the area around the victim or try to remove wires or other materials with any object, including a wooden one, until the power has been turned off
- **Check for signs of circulation** (breathing, coughing or movement). If absent, begin CPR immediately.
- **Treat for shock.**
- **Cover the affected areas** with a sterile gauze bandage.

Chemical Burns

If a chemical burns the skin, follow these steps:

- **Remove the cause of the burn** by first brushing any remaining dry chemical and then rinsing the chemical off the skin surface with cool, gently running water for 20 minutes or more.
- **Remove clothing or jewelry** that has been contaminated by the chemical.
- **Wrap the burned area loosely** with a dry, sterile dressing or a clean cloth.
- **Rewash the burned area** for several more minutes if the person experiences increased burning after the initial washing.
- **Take an over-the-counter pain reliever.** These include aspirin, ibuprofen (naproxen or acetaminophen. Use caution when giving aspirin to children or teenagers.
- Minor chemical burns usually heal without further treatment.

Seek emergency medical assistance if:

- The person shows signs of shock, such as fainting, pale complexion or breathing in a notably shallow manner.
- The chemical burn penetrated through the first layer of skin, and the resulting second-degree burn covers an area more than 3 inches (7.6 centimeters) in diameter.
- The chemical burn occurred on the eye, hands, feet, face, groin or buttocks, or over a major joint.

Respiratory burns occur from inhaling air at over 300 degrees. Some signs of burn will be singed nasal hair, facial burns, blood stained sputum or difficulty breathing. If you suspect respiratory burns have medical treatment immediately. Symptoms may be delayed.

CHEMICAL BURN in the EYE

If a chemical splashes into your eye, take these steps immediately:

- **Flush your eye with water.** Use clean, lukewarm tap water for at least 20 minutes.
- **Rinse contaminated** eye downward do fluids flow away from the other eye
- **Wash your hands with soap and water.** Thoroughly rinse your hands to be sure no chemical or soap is left on them. Your first goal is to get the chemical off the surface of your eye, but also from your hands.
- **Don't rub the eye.**
- **Remove contact lenses.** If they don't come out during the flush, then take them out.
- **Know the name of the chemical**.
- **Seek emergency medical assistance**

If you're unsure whether a substance is toxic, call the poison control center at 800-222-1222. If you seek emergency assistance, take the chemical container or a complete description of the substance with you for identification.

Dental Injuries

If your tooth is knocked out, there is a good chance it can be successfully implanted. See a dentist and follow the first aid for an avulsed tooth:

- Clean bleeding wounds with saline solution or tap water.
- Stop bleeding by applying pressure with gauze or cotton.
- Handle the tooth by the crown, not the root.
- Try to replace your tooth in the socket. If it doesn't go all the way into place, bite down slowly and gently on gauze or a moistened tea bag to help keep it in place.
- Place the tooth in milk, or clean water if the tooth won't go into the mouth socket.
- Contact the patient's dentist or take the tooth and victim to an emergency care center as quickly as possible.

Diabetic Emergencies occur when there is too much or too little sugar in the victim's blood. Interview the patient if you are not sure they are diabetic; also look for medical ID tags. If they are diabetic:

- Give sugar about 2 heaping teaspoons which is equivalent to 4 oz of orange juice, half of a candy bar.
- If there is no improvement in 15 minutes call EMS and give more sugar.

If unsure if the diabetic is suffering from too much sugar or too little sugar, always give sugar. The additional sugar will not be enough to cause further harm.

Seizures occur when the brains electrical activity becomes abnormal. This can be caused by epilepsy, high fever, infections, brain injury or other illnesses.

Symptoms of a seizure include:

- Twitching of limbs, shaking or rigid body.
- Abnormal eye movements.
- Unusual breathing pattern.
- Clenched jaw
- Frothing at the mouth.

What to do During Seizure:

- Have someone contact EMS if the seizure occurs for no known reason or if the seizures last more than 5 minutes. Call EMS if the victim is pregnant or injured.
- If possible ease the patient's fall.
- Clear the area of harmful objects.
- Try to protect the head.
- Try to maintain some privacy for the victim.

Do Not

- Gag the patient or put anything in the mouth.
- Restrain the patient during the attack.

Fainting

Fainting is a loss of consciousness due to low blood supply to the brain. Symptoms include**:**

- Loss of consciousness, usually temporary.
- Pale, clammy, cold skin.
- Slow pulse.

What to do:

- Assure open airway.
- Loosen / remove tight clothing.
- Make patient lie down on his back and raise his legs.
- Ensure plenty of fresh air.
- If possible, try to ease the patient's fall.
- If patient does not recover in a few minutes, seek immediate medical help.

Head Trauma

Most head trauma involves injuries that are minor and don't require hospitalization. However, call 911 if severe head trauma occurs:

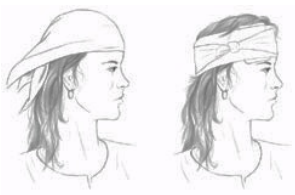
Keep the person still. Until medical help arrives, keep the injured person lying down and quiet, with the head and shoulders slightly elevated. Don't move the person unless necessary; avoid moving the person's neck.

Stop any bleeding. Apply firm pressure to the wound with sterile gauze or a clean cloth. But don't apply direct pressure to the wound, if you suspect a skull fracture.

Watch for changes in breathing and alertness. If the person shows no signs of circulation (breathing, coughing or movement), begin CPR.

Get emergency help for:

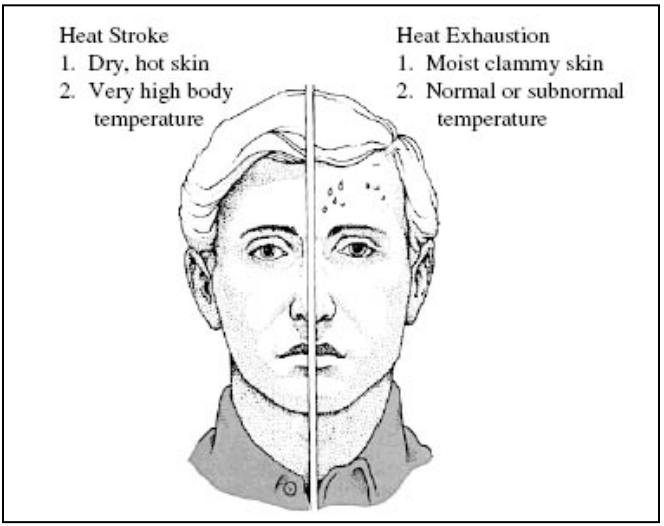
- Severe head or facial bleeding.
- Bleeding from the nose or ears.
- Severe headache
- Change in level of consciousness for more than a few seconds.
- Cessation of breathing
- Confusion.
- Loss of balance.
- Weakness or an inability to use an arm or leg.
- Unequal pupil size.
- Repeated vomiting.
- Slurred speech .
- Seizures.



For large head injuries, wrap a sterile gauze bandage around the head, "sweatband" style. Circle the head at least three times to keep the dressing underneath in place. Cut and use adhesive tape to attach the ends or tie them with a firm knot.

Heat-Related Emergencies

Heat cramps, heat exhaustion and heat stroke are heat-related syndromes which occur from prolonged exposure to high temperatures or physical activity in warm environments.



Heat Cramps are painful muscle cramps; the victim is often sweating heavily. To care for heat cramps:

- Have the victim stop their activity and rest.
- Move to a cool location.
- Give water or saline solutions to drink.
- Massage and stretch the muscle.

Heat exhaustion needs to be treated early to prevent the victim from going into heat stroke. Signs and symptoms of heat exhaustion often begin suddenly, and include:

- Nausea
- Heavy sweating
- Rapid, weak heartbeat
- Low blood pressure
- Cool, moist, pale skin
- Heat cramps
- Headache
- Fatigue

If you suspect heat exhaustion:

- Get the person into a shady, cool location.
- Lay the person down and elevate the legs and feet slightly.
- Loosen or remove the person's clothing.
- Have the person drink cool water or other nonalcoholic beverage without caffeine.
- Cool the person by spraying or sponging him or her with cool water and fanning.
- Monitor the person carefully.

Heatstroke

Is the most severe of the heat-related problems, often resulting from exercise or heavy work in hot environments combined with inadequate fluid intake.

What makes heatstroke severe and potentially life-threatening is that the body's normal mechanisms for dealing with heat stress, such as sweating and temperature control, are inadequate.

Signs and symptoms may include:

- Markedly elevated body temperature, usually over 104 F.
- Changes in mental status ranging from personality changes to confusion and coma.
- Skin may be hot and dry — although if heatstroke is caused by exertion, the skin may be moist.
- Rapid heartbeat.
- Rapid and shallow breathing.
- Elevated or lowered blood pressure.
- Irritability, confusion or unconsciousness.
- Feeling dizzy or lightheaded.
- Headache.
- Nausea.
- Fainting, which may be the first sign in older adults.

If you suspect heatstroke:

- Call 911 or emergency medical help. Intravenous fluids are needed.
- Cool the person by immersing them up to the chin in cold water.
- If immersion is not possible, cool the patient by available means: covering them with damp cold sheets or spraying with cool water.
- Do not try to force the victim to drink fluids, but the victim may drink if they are able and have the desire.

Hypothermia and Frostbite

When exposed to cold temperatures, especially with a high wind-chill factor and high humidity, or to a cool, damp environment for prolonged periods, your body's control mechanisms may fail to keep your body temperature normal. When more heat is lost than your body can generate, hypothermia, defined as an internal body temperature less than 95 F, can result. Wet or inadequate clothing, falling into cold water, and even not covering your head during cold weather can increase your chances of hypothermia.

Signs and symptoms include:

- Shivering
- Slurred speech
- Abnormal slow breathing
- Cold, pale skin
- Loss of coordination
- Fatigue, lethargy or apathy
- Confusion or memory loss

Signs and symptoms develop slowly with gradual loss of mental acuity and physical ability, victims may be unaware that they need EMS.

Treatment for hypothermia:

- **Seek emergency medical assistance.** While waiting for help to arrive, monitor the person's breathing. If breathing stops or seems dangerously slow or shallow, begin cardiopulmonary resuscitation (CPR) immediately.
- **Move the person out of the cold.** If going indoors isn't possible, protect the person from the wind, cover his or her head, and insulate his or her body from the cold ground.
- **Remove wet clothing.** Replace wet items with warm, dry ones.
- **Wrap all exposed** body surfaces with anything at hand, such as blankets, clothing, and newspapers.
- **If EMS help is delayed** start active rewarming, such as placing the victim near a heat source and placing containers of warm, but not hot, water in contact with the skin.
- **Don't give the person alcohol.** Offer warm nonalcoholic drinks, unless the person is vomiting.
- **Don't massage or rub the person.** Handle people with hypothermia gently; their skin may be frostbitten, and rubbing frostbitten tissue can cause severe damage.

Frostbite: When exposed to very cold temperatures, skin and underlying tissues may freeze, resulting in frostbite. The areas most likely to be affected by frostbite are your hands, feet, nose and ears. If your skin looks white or grayish-yellow, is very cold, and has a hard or waxy feel, you may have frostbite. Your skin may also itch, burn or feel numb. Severe frostbite can cause blistering and hardening. As the area thaws, the flesh becomes red and painful.

Treatment:

- **Protect your skin from further exposure.** If you're outside, warm frostbitten hands by tucking them into your armpits. Protect your face, nose or ears by covering the area with dry, gloved hands. Don't rub the affected area, and never rub snow on frostbitten skin.
- **Get out of the cold.** Once you're indoors, remove wet clothes. Dry and cover the exposed skin.
- **Gradually warm frostbitten areas.**
    - For **minor frostbite** skin-to-skin contact will help while getting medical help.
    - For **severe frostbite**, immerse frostbitten areas, within 24 hours, in warm water — 98 to 104 F. Wrap or cover other areas in a warm blanket.
- **Do not use chemical warmers** directly on frostbitten tissue because they can reach temperatures that can cause burns.
- **Do not walk** on frostbitten toes.

If there's any chance the affected area will freeze again, don't thaw them out.

Musculoskeletal Trauma

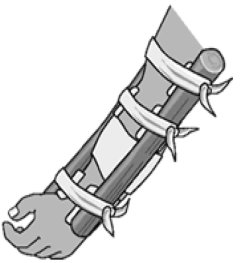
Broken Bones and Fractures

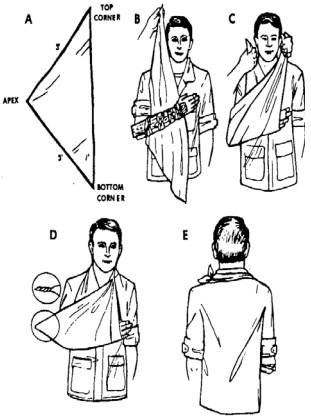
Symptoms of a broken bone: A loud cracking or snap is usually the first sign a bone is broken. It may appear deformed, swollen, bruised or visible, if the bone has pierced the skin. Other symptoms include great pain that gets worse when the limb is moved and loss of normal motion.

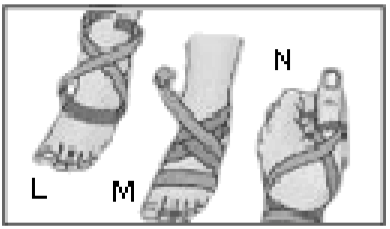
Treatment:

1. Activate EMS (911).
2. Cover any open with wound with a clean sterile dressing.
3. Do not try to move or straighten an injured extremity.
4. If you need to move the victim, or EMS is detained, stabilize the injured extremity to prevent movement. Activate EMS (911).
5. Treat for shock.
6. Apply ice if possible.

It is important that you not try to use or move the broken limb. Moving a broken bone can cause more damage to blood vessels, nerves and other tissues. To keep the broken parts still, make a temporary splint by taping a ruler or other support material to the limb that has been injured. If it is an open fracture, control bleeding, and stabilize the wound by packing bandaging material around the structure.







Sling: If an arm has been broken, a sling can also be made from a scarf hung from the neck. Once your broken bone is secured, seek medical attention.

The figure-of-eight bandage is good to use around joint areas such as ankle (see L, M); finger and thumb (see N); elbow; and knee, due to the good support it provides in those areas.

Musculoskeletal Trauma

Sprains, Strains and Bruising.

Sprains: are injuries that affect ligaments, the thick bands of cartilage that attach bone to bone. They occur in response to a stretch or tear of a ligament.

Strains: are injuries that affect muscles or tendons, the thick bands that attach muscles to bones. They occur in response to a quick tear, twist, or pull of the muscle.

Contusion or Bruise: Results from a blow to the muscle.

Treatment:

1) Cold application, preferably with a plastic bag or damp cloth filled with ice and water. Gel packs are not as effective.
2) To prevent cold injury, limit each application of cold less than 20 minutes. Less time if the cold makes the victim uncomfortable.
3) Place a barrier between the cold container and the skin.

The Earlier the Treatment, the Better the Results

R

I

C

E

R: Rest the injured area. If moving the injured area causes pain, your body is telling you to stop.

I: Ice applied to the injured area will help to reduce swelling and ease the pain. Cover the ice pack with a wet cloth and apply the ice for 10 to 20 minutes intermittently. This is beneficial for the first 1-2 days. If you have a cast, be sure to place a towel between the cast and the bag of ice.

C: Compression or use of a pressure bandage may help to prevent or reduce swelling. Use an elastic bandage. Wrap the injured area with the bandage, but not so tightly that the blood is cut off. It should not be painful. Fingers or toes beyond the bandage should remain pink and not become "tingly."

E: Elevation means raising the injured area above the level of the heart. While you are healing this will help reduce swelling. Prop up a leg or arm while resting it. Do not do if it causes pain.

Vitamin C helps to encourage the development of collagen, which aids the body in forming healthy bones.

Poisoning

Many conditions mimic the signs and symptoms of poisoning, including seizures, alcohol intoxication, stroke and insulin reaction. Look for the signs and symptoms listed below, and if you suspect poisoning, call your regional poison control center or, the National Poison Control Center at 800-222-1222 before giving anything to the affected person.

Signs and symptoms of poisoning:

- Burns, redness or odor around the mouth or lips.
- Breath that smells like chemicals, such as gasoline or paint thinner.
- Burns, stains and odors on the person, on their clothing, or on the furniture, floor, rugs or other objects in the surrounding area.
- Empty medication bottles or scattered pills.
- Vomiting, difficulty breathing, sleepiness, confusion or other unexpected signs.

Call National Poison Control Center
800-222-1222.

Do not induce vomiting or give the patient anything to drink, including activated charcoal, unless told so by medical personnel.

When to call for help. Call 911 or your local emergency number immediately if the person is:

- Drowsy or unconscious.
- Having difficulty or has stopped breathing.
- Uncontrollably restless or agitated.
- Having seizures.

Keep all poisons locked safely away. Use Mr. Yuk stickers on poisons.

If the person seems stable and has no symptoms, but you suspect poisoning, call the National Poison Control Center. Provide information about:

- The person's symptoms.
- The person's age and weight.
- Any information you have about the poison, such as amount and length of time since the person was exposed to the substance.
- If possible, have the pill bottle or poison container on hand when you call.

What to do while waiting for help:

- If the person has been exposed to poisonous fumes, such as carbon monoxide, get him or her into fresh air immediately.

- Follow treatment directions by the poison control center.
- If the poison spilled on the person's clothing, skin or eyes, remove the clothing.
- Flush the skin or eyes with cool or lukewarm water, such as by using a shower for 20 minutes or until help arrives.
- Make sure the person is breathing. If not, start rescue breathing and CPR.
- Take the poison container (or any pill bottles) with you to the hospital.

Seizures

Seizures occur when the brains electrical activity becomes abnormal. This can be caused by epilepsy, high fever, infections, brain injury or other illnesses.

Symptoms of a seizure include:

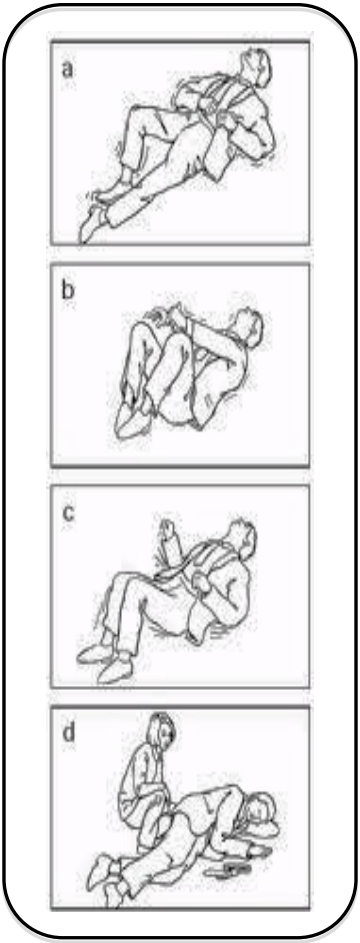
- Twitching of limbs, shaking or rigid body.
- Abnormal eye movements.
- Unusual breathing pattern.
- Clenched jaw.
- Frothing at the mouth.

What to do during a seizure:

- Have someone contact EMS if the seizure occurs for no known reason or if the seizure lasts more than five minutes. Call EMS if the victim is pregnant or injured.
- If possible, ease the patient's fall.
- Clear the area of harmful objects.
- Try to protect the head.
- Try to maintain some privacy for the victim.

After Seizure:

- Remove tight clothing.
- Position the patient in the recovery position.



Generalized tonic clonic seizures (grand mal seizures) are the most common type of generalized seizure. They begin with stiffening of the limbs followed by jerking of the limbs and face.

Stroke

Stroke occurs when there's bleeding into your brain or when normal blood flow to your brain is interrupted, usually by a clot. Within minutes brain cells start dying — a process that may continue over several hours.

Signs and symptoms of a stroke include:

- Sudden weakness or numbness in your face, arm or leg on one side of your body.
- Sudden dimness, blurring or loss of vision, particularly in one eye.
- Loss of speech, trouble talking or understanding speech.
- Sudden, severe headache with no apparent cause.
- Unexplained dizziness or trouble walking; loss of coordination.
- Unsteadiness or a sudden fall, especially if accompanied by any of the other signs or symptoms

The Cincinnati Pre-Hospital Stroke Scale

Facial droop (have patient show teeth or smile)
Normal—both sides of face move equally
Abnormal—one side of face does not move as well as the other side
Arm drift (patient closes eyes and holds arms straight out for 10 seconds)
Normal—both arms move the same or both arms do not move at all
Abnormal—one arm does not move or one arm drifts down unevenly
Speech Test – (have the patient say "You can't teach an old dog new tricks.")
Normal –Patient uses correct words with no slurring.
Abnormal – Patient slurs words, uses the wrong words, or is unable to speak.

If any 1 of these 3 signs is abnormal, the probability of stroke is 72%.

Risk Factors for a stroke include:

Unchangeable Risk Factors	Changeable Risk Factors
• Increasing age. • Males have a greater risk than women. • Heredity, family history of stroke. • African-Americans tend to have a higher risk than other racial groups.	• High blood cholesterol or triglyceride levels. • Diabetes. • High blood pressure. • Lack of physical activity. • Obesity. • Stress. • Heart disease • Tobacco smoking.

Treatment for Stroke A stroke is a true emergency.

- Call EMS (911 for most areas).
- Document the time of the symptom onset.
- If breathing and circulation are present, place victim on their affected side.
- Administer supplemental oxygen, and monitor breathing.

Emergency Oxygen Administration Training

There are two broad purposes of this Emergency Oxygen Training (EOT) section. The first is to provide educational material for proper understanding of the regulatory and mechanical use of Emergency Oxygen equipment. This includes policies, labels, parts, service, and safety topics. The second purpose is to provide educational material for proper use of Emergency Oxygen equipment as part of emergency first aid following injury or illness. This includes how to support breathing and resuscitate a non-breathing person with an Emergency Oxygen unit.

Importance of Oxygen and Emergency Oxygen Equipment

Oxygen is the body's fuel and so all human beings require a constant supply of oxygen circulating in our blood and reaching our organs in order to survive. Fortunately, the air contains plenty (21% of the air is oxygen), so the needs of our cells and organs are easily met. However, threats to our safety, health and stability exist. If, for any reason, an insufficient amount of oxygenated blood reaches the tissues and organs, a person experiences medical emergency called **shock**. **Shock** can lead to organ failure, brain damage and death.

If the oxygen level drops and continues to be low, the result can be:

- Brain damage
- Organ failure
- Death.

Without oxygen, brain damage begins within four minutes.

While there are many causes and categories of problems that can produce a medical emergency, approximately 95 percent involve a person who is **breathing**. To ensure an adequate supply of oxygen in a breathing emergency, you will learn how to use the LifeSafe Emergency Oxygen device.

For the 5 percent of emergencies in which a person **stops breathing**, regardless of cause, the demand for oxygen begins immediately. After four minutes without adequate oxygen, organs, including the brain, are likely to become damaged, perhaps irreversibly. After two or more minutes, death is likely. To help a person who has stopped breathing, an important emergency first aid procedure –in addition to cardiopulmonary resuscitation (CPR) – is to provide supplemental oxygen.

Signs and symptoms of hypoxia and shock include:

- Increased breathing and heart rate.
- Changes in level of consciousness.
- Restlessness.
- Cyanosis (bluish lips and nail beds).
- Chest pain.
- Irregular breathing.
- Wheezing or high-pitched noises while breathing.
- Shortness of breath.
- Dizziness.
- Abnormal skin tone, flushed or bluish.

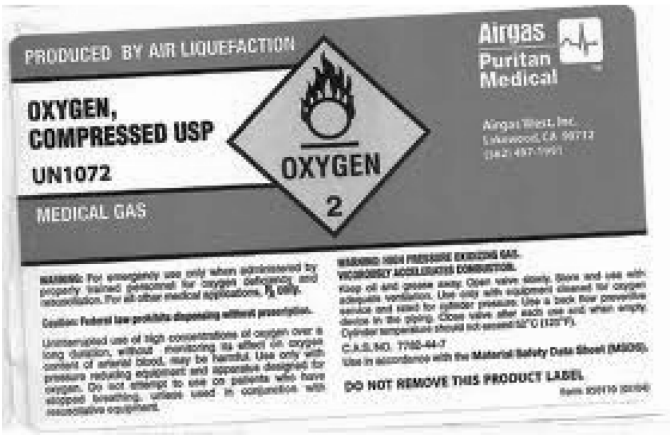
The most common use of oxygen is on a conscious, breathing patient. The three scenarios you may encounter are:

- Conscious breathing.
- Unconscious breathing.
- Unconscious, not breathing.

Labeling Requirements

Each cylinder for the LifeSafe Emergency Oxygen device and the LifeSafe Therapy Oxygen device is labeled with the following required information:

1. Product name: Oxygen USP (US Pharmacopeia, medical grade).
2. Contents: by liters in the cylinder.
3. Expiration date: month and year oxygen should be replaced.
4. Lot number: source from which oxygen was drawn.
5. Method of production: how it was extracted.
6. Precautionary statements: indicating emergency or prescription use.



Oxygen Regulations, Policies and Protection

Medical oxygen devices and medical oxygen gas are regulated in the United States by the U.S. Food and Drug Administration (FDA).

An **Emergency Oxygen** device is regulated as appropriate for use without prescription and without medical supervision by properly trained responders when used in a medical emergency. The FDA qualifies an Emergency Oxygen device as one that delivers medical oxygen at a minimum flow rate of six liters per minute (LPM) for a minimum of 15 minutes. The LifeSafe Emergency Oxygen device meets this FDA requirement because it delivers medical grade oxygen at a flow rate of eight LPM for approximately 60 minutes.

If a medical oxygen device is capable of delivering medical oxygen at flow rates that are less than 6 liters per minute (LPM) or if the device permits delivery for less than 15 minutes, then the FDA considers this to be a **Prescription Oxygen** device. This type of device may only be used with a prescription and by a person either medically qualified or acting under medical supervision. The LifeSafe Therapy Oxygen device is provided by prescription because it delivers medical grade oxygen at flow rates ranging from 2 LPM to 25 LPM. At 2 LPM the device delivers for over 100 minutes and at 25 LPM the device delivers for over 15 minutes.

Oxygen Equipment Parts

LifeSafe Emergency and Therapy Oxygen equipment consists of four parts: cylinder, regulator with gauge, handle, and delivery system: tubing, nasal cannula or mask. The assembled unit is enclosed in a protective case.

The cylinder holds medical oxygen in the form of compressed gas. LifeSafe cylinders are made of seamless steel or aluminum and meet Department of Transportation (DOT) requirements for pressure. LifeSafe steel cylinders qualify for pressure retest at 10-year intervals. Aluminum cylinders require retest at five-year intervals.

On the top of the cylinder is a **post valve** with two pinholes, an outlet and a **cap**. The pinholes are set to international specifications that will permit only an oxygen regulator to fit. The cap is set to permit connection by a handle for releasing the oxygen from the cylinder through the outlet.

The LifeSafe Emergency Oxygen device uses a steel cylinder that holds approximately 529 liters. It weighs approximately 11 lbs. empty and 12 ¼ lbs. when full.

The LifeSafe Therapy Oxygen device uses a steel cylinder that holds 1200 liters. It weighs approximately 30 lbs. empty and 33 lbs. when full.

Regulator with Gauge

The oxygen regulator has two pins that fit into the post of the cylinder. The cylinder valve connection allows the oxygen released from the cylinder to move directly into the regulator. The regulator is tightened to the cylinder to prevent a leak. The cylinder gauge reads empty when the device is at rest. When the gas is released from the cylinder, it enters the regulator and the gauge registers content pressure.

Handle

The handle sits on top of the cylinder's post. When the handle is turned, it opens the flow of oxygen from the cylinder to the regulator. Some devices use a two-stage "low pressure" regulator that reduces the pressure of the oxygen to less than two psi.

Delivery System: Tubing, Cannula and Masks

Containers for oxygen are made of either steel or aluminum and have been used for over 50 years. Container sizes vary and hold from 76 liters to 1,100 liters. Oxygen is delivered from the regulator to the patient with a medical tube/hose. Medical oxygen tubing is made of medical grade materials that permit the oxygen to pass from the regulator to the patient cleanly, safely, and at the required flow rate. The LifeSafe Emergency Oxygen and LifeSafe Therapy Oxygen device uses green PVC oxygen tube or Star Lumen tubing both of which resist kinking. All medical oxygen tubing is for single use only, which means after each patient use it must be replaced.

A nasal cannula fits over the patient's head then two small prongs are inserted into the patient's nose. Oxygen is delivered through a nasal cannula at a flow rate of one to six LPM, which means it is primarily used as part of the LifeSafe Therapy Oxygen device.

A **nasal cannula** is a plastic tube with two small prongs that are inserted into the victim's nose. This device is used to administer oxygen to a breathing victim with minor breathing problems. Oxygen is normally delivered through a nasal cannula at a low flow rate of one to six LPM.

Nasal cannulas can also be used if the victim does not want a mask on his or her face. It is also possible to simply hold the mask under the chin.

Simple Face Mask
is connected to the tubing in the LifeSafe Emergency Oxygen device. The simple mask is placed over the patient's nose and mouth and can be held in place either by the patient or rescuer, or with a strap.

A Non-Rebreather Mask
may be used to deliver high concentration oxygen to a breathing patient. A non-rebreather mask has an attached oxygen reservoir bag which collects additional oxygen from the regulator and a one-way valve which prevents the victim's exhaled air
from mixing with the oxygen in the reservoir bag.

A Resuscitation Face Mask serves two purposes. For the breathing patient, it permits delivery of oxygen similar to a simple face mask. For the non-breathing patient, it can be pressed tightly over the nose and mouth by a trained rescuer to provide rescue breaths as part of cardiopulmonary resuscitation (CPR).

When using the LifeSafe Emergency Oxygen unit, the simple mask can be removed and the resuscitation face mask can be connected to the tubing. The resuscitation mask can be placed over the patient's face in order for oxygen to be absorbed into the patient's airway during CPR.

A Resuscitation Bag Valve Mask (BVM) is a device that is placed over the nose and mouth of a non-breathing patient. When using an Emergency Oxygen unit, the simple or the resuscitation face mask can be removed and the BVM connected to the tubing. Each squeeze of the bag forces oxygen-enriched air through a valve and the mask, and into the patient's airway.

Administering Emergency Oxygen to a Conscious Patient

- Survey the scene. Do not approach a victim unless it is safe.
- Gently shake the victim and ask if they are okay.
- If they respond, introduce yourself and request consent.
- Activate 911.
- Send someone to get Emergency Oxygen and an AED.
- Administer oxygen:
    - Activate the oxygen flow to the mask. Some units are equipped with an easy on/off handle.
    - Listen or feel for oxygen flow through the mask.

- Assist victim with mask. If patient is able, instruct them to hold the mask to their mouth and nose assuring a tight seal.
- Instruct the patient to breathe as normal as possible.

- Perform a head-to-toe exam.
- Provide first aid, if needed.
- Care for shock.
- Continue to assess and assist the victim until EMS arrives.

Emergency Oxygen to an Unconscious, Breathing Patient

- Survey the scene: Do not approach unless it is safe.
- Gently shake the victim and ask if they are okay.
- If there is no response, activate 911.
- Send someone to get Emergency Oxygen and AED.
- Introduce yourself, assume consent for unresponsive victims.
- Look, listen and feel for breathing.
- If the victim is breathing regularly, administer emergency oxygen.

- Activate the oxygen flow to the mask. Some units are equipped with an easy on/off handle.
- Listen or feel for oxygen flow through the mask.
- Place the oxygen mask over the patient's nose and mouth forming a tight seal. Do not use the strap behind the head if you suspect head or neck injuries.

- Provide first aid if needed.
- Care for shock and continue to access the victim.

Emergency Oxygen to an Unconscious, Non-Breathing Patient

- Survey the scene. Do not approach a victim unless it is safe.
- Gently shake the victim and ask if they are okay.
- If there is no response, activate 911.
- Send someone to get Emergency Oxygen and AED.
- Introduce yourself, assume consent for unresponsive victims.
- Look, listen and feel for breathing. If they are not breathing normally, **begin chest compressions**.

SEE PAGE 8

If you have not been trained in CPR, perform chest compressions. Place your hands in the middle of the breastbone in the middle of the chest. Press hard, press fast.

Passive ventilation offers an alternate method of oxygen delivery for out-of-hospital cardiac arrest patients. Comparing the survival of out-of-hospital cardiac arrest patients receiving initial passive ventilation (oxygen flowing into a mask placed over the patient's nose and mouth) with survival based on receiving initial bag-valve-mask ventilation, the conclusion is: among adult, witnessed, VF, VT out-of-hospital, cardiac-arrest resuscitated patients with minimally interrupted cardiac resuscitation, survival to hospital discharge was higher for individuals receiving initial passive oxygen administration.

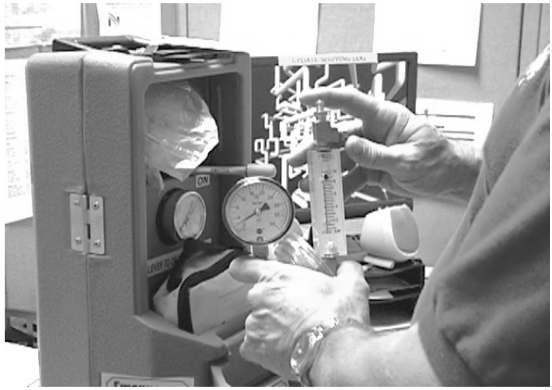
Annals of Emergency Medicine, 2009;54:656-662

Emergency Oxygen Maintenance

Medical grade oxygen units need to be inspected on a routine basis. This is true regardless of their use. The regulator, cylinder and other components need to be evaluated on a routine schedule by a person knowledgeable with the equipment and testing tools.

Service and Maintenance Recommendations:

- Visual examination and inspection of the cylinder and case.
- Assure all local, state and federal regulations are compliant.
- Assess cylinder labeling compliance.
- Assess regulator liter flow using a flow meter gauge.
- Assess regulator static-back pressure.
- Assess high pressure safety release.



- Assess total pressure reduction.
- Assess seals and connections.
- Examine hydrostatic test date.
- Assure the oxygen unit is securely mounted.
- Inspect oxygen level. Refill unit if level is lower than twice the expected EMS time. If you utilize an oxygen maintenance company, they will refill the oxygen during inspection.
- Assure oxygen delivery device (ie: mask) is present and inspected. If the mask has been used, it must be disposed of properly following BBP guidelines.
- Train enough people in Emergency Oxygen Administration, so that there are at least two rescuers per location during all operating hours.

Safe Handling of Oxygen Equipment

The FDA and the National Institute of the Occupational Safety and Health Administration (NIOSH) recommend that users of medical oxygen follow safe handling and use procedures. The following is a summary:

- **Do not permit smoking near oxygen**. Beyond simply not smoking when oxygen is in use; this includes the prohibition of smoking from any area where oxygen is stored.
- **Store oxygen in a clean, dry location away from direct sunlight or heat**. Consider window locations and heat that may be behind a wall. This is because heat and sunlight can increase the pressure within the oxygen cylinder, which will give a false (high/filled) reading on the gauge. Also, too much heat can cause the pressure in the cylinder to reach the "escape" level that will empty the device. The LifeSafe Emergency and Therapy Oxygen devices have valves that will release oxygen safely into the air if the cylinder pressure becomes too high.
- **Do not allow the parts of oxygen equipment – cylinder or post value, regulator, handle, delivery system – to come in contact with oils, greases, organic lubricants, or any other combustible products**. Additionally, if using oxygen, hands should be clean or the user should wear protective gloves. This is because oxygen is incompatible with hydrocarbons. When they mix, the result can be combustion – the sudden release of heat and fire.
- **All cleaning, repair, servicing and refilling of oxygen equipment is performed by qualified, properly trained personnel**. After each use, LifeSafe oxygen service personnel should be contacted.
- **Use only tools specifically designed for "Oxygen Equipment" during oxygen equipment service**. After each use, LifeSafe service personnel should be contacted. LifeSafe oxygen service personnel are qualified and trained in the use these tools.
- **Ensure that the oxygen regulator does not have parts that impede oxygen flow**. The connection on the post value to the regulator and from the regulator to the cannula or mask must be clear. This is ensured by using compatible parts and routinely inspecting and replacing parts by LifeSafe oxygen service technicians.
- **Use plugs, caps, and other protected covers to maintain clean parts**. Store masks and other delivery system parts in clean bags and use protective covers and gloves when handling oxygen.
- **Protect all stand-alone oxygen cylinders from contaminants and particulates**. Use a cap cover when storing unused, filled, medical oxygen cylinders.

Bloodborne and Airborne Pathogens

Bloodborne Pathogens Training

BBP is required by the Occupational Safety and Health (OSHA) standard 29 CFR 1910.1030, and was established in 1991. It states the employer must minimize the exposure of students and employees to bloodborne pathogens whenever the potential for that exposure exists. OSHA has taken the position that there are no "risk-free" populations and enforcement of OSHA's general duty clause implies that employers **must** be knowledgeable of and comply with the bloodborne pathogens standard. Risk is minimized by using universal precautions in conjunction with protective equipment, as appropriate, and maintaining proper housekeeping and workplace practices. OSHA requires annual training to ensure employee safety in the workforce.

Bloodborne Pathogens

(BBPs) are microorganisms in the blood or other body fluids that can cause illness and disease in people. These microorganisms can be transmitted through your contact with contaminated blood and body fluids.

Exposure to blood and other body fluids occurs across a wide variety of occupations. Health care workers, emergency response and public safety personnel, and other workers can be exposed to blood through needle stick and other sharps injuries, mucous membrane, and skin exposures. The pathogens of primary concern are the human immunodeficiency virus (HIV), hepatitis B virus (HBV), and hepatitis C virus (HCV).

Other diseases are also carried through the blood such as syphilis and malaria. Workers and employers are urged to take advantage of available engineering controls and work practices to prevent exposure to body fluids.

Means of Transmission

BBPs are transmitted when contaminated blood or body fluids enter the body of one person from another person. Some examples include:

- An accidental puncture by a sharp object contaminated with the pathogen.
- Open cuts, rashes, hang nails or other skin openings that come into contact with contaminated blood or body fluids.
- Indirect transmission (a person touches dried or caked-on blood and then touches a mucous membrane such as the eyes, mouth, nose, or an open cut). This may be from splashing blood.
- Puncture wounds caused by a contaminated item.
- Sexual contact. Sharing needles.
- A mother infecting her baby during birth.

Four conditions must be met for transmission:

- ❖ A pathogen is present.
- ❖ There is enough of the pathogen to cause disease.
- ❖ A person is susceptible to the pathogen.
- ❖ The pathogen passes through the correct entry site.

Hepatitis B (HBV)

HBV is a virus that can infect and inflame the liver. It is transmitted primarily through "blood-to-blood" contact. HBV can lead to serious conditions such as cirrhosis and liver cancer. The virus can survive in dried blood for up to seven days. The Centers for Disease Control estimates there are approximately 280,000 HBV infections in the U.S. each year.

Hepatitis C (HCV)

HCV is an infection caused by a virus that attacks the liver and leads to inflammation. Most people infected with the hepatitis C virus (HCV) have no symptoms. In fact, most people don't know they have the hepatitis C infection until liver damage shows up, decades later, during routine medical tests.

Transmission of HBV and HCV

HBV and HCV are transmitted through blood and other potentially infectious bodily fluids and tissues. They are transmitted through:

- Sexual contact.
- Sharing needles.
- Accidental needle sticks.
- From mother to child.

There is no "cure" or specific treatment for HBV, but there is a vaccine to prevent HBV. There is no vaccine for HCV.

HBV Symptoms:

- Mild flu-like symptoms:
- Fatigue
- Stomach pain
- Loss of appetite
- Nausea
- Jaundice
- Dark Urine

HCV Symptoms: Infection usually produces no signs or symptoms during its earliest stages. When signs and symptoms do occur, they're generally mild and flu-like, and may include:

- Fatigue and Fever.
- Nausea or poor appetite.
- Muscle and joint pains.
- Tenderness in the area of your liver.

Hepatitis B Vaccinations

Employees who have routine exposure to BBPs (such as doctors, nurses, first-aid responders, etc.) must be offered the Hepatitis B vaccine series at no cost to themselves unless:

- They previously received the vaccine series.
- Antibody testing has revealed an immunity.
- The vaccine is contra-indicated for some medical reason, such as an allergy to yeast, which is in the vaccine.

Vaccination process includes:

- Series of three shots.
- 2nd shot is given one month after the 1st
- 3rd shot follows five months after 2nd.

This series must be offered at no cost to the employee during work hours.

The vaccination must be offered within 10 days of initial assignment to a job where exposure to blood or other potentially infectious materials can be reasonably anticipated. Employees may opt to have their blood tested for antibodies to determine the need for the vaccine; however, employers may not make such screening a condition of receiving the vaccination. Employers are not required to provide pre-screening.

Employees may opt to decline the vaccine, but they must complete a declination form. Employers must keep these forms on file so that they know the vaccination status of everyone who has a potential exposure to blood. The employee has the right to change his/her mind at any time.

HBV Vaccine Side Effects

The vaccines are mild, and is well tolerated by most people. The most common symptoms are bruising, redness, headache, localized swelling and pain at the injection site. Severe side effects include allergic reactions – if this occurs seek medical help.

HIV: the Virus that Causes AIDS

HIV (human immunodeficiency virus) is the virus that causes **AIDS**, or acquired immune deficiency syndrome. The Center for Disease Control (CDC) estimates that more than one million people in the U.S. are living with HIV infection. One in five (21%) of those people living with HIV is unaware of their infection. An estimated 56,300 Americans become infected with HIV each year. There's no cure for HIV/AIDS, but there are medications that can dramatically slow the progression of the disease. These drugs have reduced AIDS deaths in many developed nations.

Transmission of HIV

HIV is transmitted through infected blood, semen or vaginal secretions that must enter your body. You cannot become infected through ordinary contact: hugging, kissing, playing sports or shaking hands with a person infected with HIV or AIDS. HIV can't be transmitted through the air, water or insect bites.

Symptoms of HIV

Being infected with HIV and becoming sick from AIDS are two different events. For most people, it takes many years from the time someone is infected with HIV before they develop symptoms of AIDS. Some people get sick sooner and others stay well longer, especially with treatment. However, there is almost always a significant period of time after infection when an HIV-positive individual will have no symptoms at all, often 10 years or more. Symptoms of HIV infection can vary, but often include:

- Weakness
- Fever
- Sore throat
- Nausea
- Headaches
- Diarrhea
- Swollen lymph glands
- Weight loss

HIV Treatment

There is no cure for HIV/AIDS so precaution is the best defense. The CDC has established **Universal Precautions** to help prevent infection from a bloodborne pathogen. While there is no cure for HIV, there are a variety of

drugs that can be used in combination to control the virus. The CDC recommends a four-week regimen of medication for prophylaxis after exposure to infected body substances.

Prevention

Since there is no cure for some bloodborne pathogen diseases, use caution.

- Don't have unprotected sex, use illicit drugs or share needles.
- Don't worry about getting one of these diseases through casual contact.
- Don't eat or drink, or keep food and drinks in areas where infectious materials are used.
- Never pipette by mouth.
- Never break, bend or recap contaminated needles.
- Don't clean up broken glass by hand, use a broom and dustpan.

"An Ounce of Prevention is Worth a Pound of Cure."
Benjamin Franklin

Universal Precautions

The CDC states that universal precautions are a set of practices designed to prevent transmission of human immunodeficiency virus (HIV), hepatitis B virus (HBV), and other bloodborne pathogens when coming into contact with an infected person. Under universal precautions, blood and certain body fluids of all patients are considered potentially infectious for HIV, HBV and other bloodborne pathogens. Universal precautions apply to:

- Blood
- Amniotic Fluid
- Synovial Fluid
- Semen
- Pleural fluid
- Vaginal secretions
- Cerebrospinal fluid
- Peritoneal fluid
- Pericardial fluid
- Other body fluids containing visible blood

OSHA attempts to reduce the risk and exposure of BBP's to employees by instituting **Engineering Controls**, **Workplace Practice Controls, Universal Precautions** and **Personal Protective Equipment (PPE)**. Engineering controls help minimize risk by improving the design and engineering of tools and equipment to enhance safety. Work practices are designed to influence the actions of employees to work with the engineering designs. Your employer is responsible for the cost of implementing these practices.

Engineering Controls are physical or mechanical systems used to eliminate hazards at their source and prevent employee exposures. A couple of examples include:

- Hand-washing or antiseptic facilities must be available at or near the point of care.
- Sharps containers properly located and at the proper height.

Work Practice Controls are specific procedures or policies that must be followed to reduce your risk of exposure to blood or other potentially infectious materials (OPIM). A couple of examples include:

- Hand-hygiene policy that provides specific guidance on when and how to perform hand hygiene.
- Rules requiring the disposal of sharps into sharps containers immediately after use.

Personal Protective Equipment (PPE)

The goal of PPE is to provide a barrier between you and potential infections. Employers must make available, and employees must use, personal protective equipment (PPE) when the possibility of exposure to blood or infectious materials exists.
PPE must be accessible and clean.

Gloves should be disposable and replaced as soon as they are torn or punctured. They should be made of latex or other fluid-impervious material.

- Inspect gloves before use.
- Double gloving can provide an additional layer of protection.
- If you have cuts or sores on your hands, you should cover these with a bandage or similar protection as an additional precaution before donning your gloves.
- Don't touch the outside of used gloves.
- Gloves should be carefully pulled off, inside-out, one at a time, so the contaminated surfaces are inside, preventing any contact with any potentially infectious material.
  When removing the first glove, your hand is protected because both are covered with the glove. Grab the outside of the infected glove and remove. To remove the second glove, your other hand is no longer protected, so carefully slide one finger inside the glove,

where there is protection, and remove the glove by inverting it upon itself. Change gloves and wash your hands if dealing with more then one victim. Never rub the eyes, mouth, or face while wearing gloves. Dispose of gloves in biohazard disposal bags.

1. **Eye Protection** must be worn if there is a chance for a splash to occur.
2. **Face Shields** provide protection to the nose, mouth and face to protect the mucus membranes and skin openings.

3. **Caps** are designed to protect and cover the head.
4. **Gowns, aprons or jumpsuits** protect contaminated materials from exposed skin and clothes.
5. **Booties** will cover the shoes and should be tied securely.
6. **Pocket mouth-to-mouth resuscitation masks** provide a barrier
7. during CPR.

Any PPE or clothing items that become infected with OPIM must be safely removed and treated as an infectious material with proper disposal in correctly labeled bags or containers.

Hand Washing

Hand washing is one of the most important (and easiest) practices used to prevent transmission of bloodborne pathogens. It is required that you wash your hands after removal of gloves and other PPE and/or cleaning of BBP areas.

- Wash hands or other exposed skin thoroughly as soon as possible following an exposure incident.
- Use antibacterial soap.
- Don't use harsh, abrasive soaps.
- Wash your hands with soap and warm water for at least 20 seconds.
- Be sure to wash between fingers and under fingernails.

Wash your hands for at Least 20 seconds.

Hand washing facilities are required to be provided by the employer and accessible to all employees. It is specified that the path to the hand washing facility is easily accessed without the impediment of doors, hallways or stairwells. The employer must provide proper antiseptic hand cleaners for certain jobs, such as those outside of an office.

Hygiene Rules: If you are working in an area where there is reasonable likelihood of exposure, you should never:

- Eat
- Drink
- Smoke
- Apply cosmetics or lip balm
- Handle contact lenses

Food Rules!
Do not keep food or drink in refrigerators, freezers, shelves, cabinets, or on counter-tops where blood or potentially infectious materials are present.

Regulated Waste

The bloodborne pathogens standard uses the term, "regulated waste," to refer to the following categories of waste:

- Liquid or semi-liquid blood or other potentially infectious materials (OPIM).
- Items contaminated with blood or OPIM that could be released in a liquid or semi-liquid state if compressed.
- Items that are caked with dried blood or OPIM that could be released during handling.
- Contaminated sharps.
- Pathological and microbiological wastes containing blood or OPIM.

Disposal of regulated waste must be in accordance with applicable state regulations. In addition to state rules for disposing of regulated waste, there are basic OSHA requirements that protect workers. The OSHA rules state that regulated waste must be placed in containers which are:

- Closable.
- Constructed to contain all contents and prevent leakage of fluids during handling, storage, transport or shipping.
- Red or Red-orange in color.
- Labeled or color-coded in accordance with the standard.
- Closed prior to removal to prevent spillage or protrusion of contents during handling, storage, transport, or shipping.
- If outside contamination of the regulated waste container occurs, it must be placed in a second container meeting the above standards.

Biohazard bags must be a bright red or red-orange color and contain the universal symbol as shown below.

The Needlestick Safety and Prevention Act

Was signed into law on November 6, 2000, because occupational exposure to bloodborne pathogens from accidental sharps injuries in healthcare and other occupational settings continued to be a serious problem. The law set forth to strengthen OSHA's requirement for employers to identify, evaluate, and implement safer medical devices. The act also mandated additional requirements for maintaining a sharps injury log and for the involvement of non-managerial healthcare workers in evaluating and choosing devices. The log must be recorded and maintained in such a manner so as to protect the confidentiality of the injured employee.

The log must contain the following:

1. Date of injury.
2. Type and brand of the device involved.
3. Where the incident occurred.
4. How the incident occurred.

Needles and Sharp Tools

Sharps should be evaluated on an annual basis to assess the possible use of newer safety products. Using safer medical devices and equipment can help minimize the exposure to BBPs. Examples of these devices include self-sheathing and retractable devices, splash guards, medical devices engineered to reduce the risk of needle sticks and other injuries.

These include not only sharps with engineered sharps-injury protection and needleless systems, but also other medical devices designed to reduce the risk of sharps-injury exposures to bloodborne pathogens.

Handle <u>contaminated</u> sharps properly and safely:

- Don't bend, recap or remove contaminated needles, or other contaminated sharps, unless it can be demonstrated that there is no feasible alternative or that it's required by a specific procedure. If bending, recapping, or needle-removal is necessary, it must be done using a mechanical device or a one-handed technique.
- Don't shear or break contaminated needles.

Handle <u>reusable</u> sharps properly and safely:

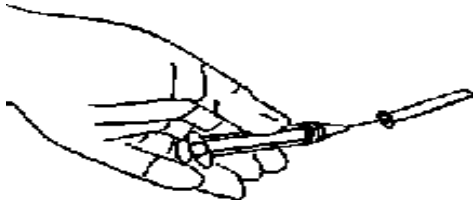
- Place contaminated reusable sharps in appropriate containers immediately, or as soon as possible.
- Store or process contaminated reusable sharps so that staff members are not required to reach into the container or sink by hand.
- Ensure reusable sharps containers aren't opened, emptied or cleaned manually, or in any other manner that would expose staff to contaminated sharps.

Don't pick up broken glassware with your hands. Use a broom and dustpan, or tongs.

If re-capping is required:

Use one-handed scoop technique:

- Place needle cap on table.
- Holding the syringe only, guide needle into cap.
- Lift up syringe so cap is sitting on needle hub.
  Secure needle cap into place.



Sharp Containers

Contaminated sharps are discarded immediately after use in containers:

- That are closable.
- Puncture-resistant.
- Leak-proof on sides and bottoms.
- Labeled or color-coded appropriately.
- Easily accessible to personnel.

- Located as close to where sharps are used as feasible.
- Maintained upright throughout use.
- Replaced routinely and not allowed to overfill.

At no time should a person try to reach into a disposable-sharps container.

If Exposure Occurs, Follow These Steps

- Immediately stop and wash your hands with soap and water.
- Flush mucous membranes.
- Report the incident to your supervisor immediately.
- Attempt to identify the source individual and collect any contaminated materials for testing purposes.
- Seek medical evaluation. If you have not had the HBV vaccine, it can still be administered after an exposure.

The employer is responsible for ensuring the confidentiality of your medical records. Your records can not be disclosed without your written consent.

If clothing becomes contaminated with potentially infectious pathogens, remove them in a manner that avoids contact with skin and mucous membranes. If necessary, cut the shirt to safely avoid contact with the body.

Exposure Control Plan

The exposure control plan is a guideline for employees that have had exposure to blood or OPIM. Each work area where employees may be exposed to blood or body fluids must formulate an Exposure Control Plan.

The Exposure Control Plan is important because it details your plan for reducing exposures to bloodborne pathogens and details steps to take when exposure occurs. The plan includes but is not limited to:

- Employee exposure determination (a list of job classifications where employees may be exposed).
- HBV vaccination provisions.
- Employee training (initial and annual training).
- Methods for control of BBPs.
- Universal precaution.
- Engineering controls (i.e., safety devices and sharps containers).

Your Exposure Control Plan must be:

- Specific to your department.
- Reviewed yearly.
- Accessible to all workers.

- Work practice controls (i.e., sharps handling and disposal, hand washing, cleanup).
- Personal protective equipment (i.e., disposable gloves, face shields)
- Housekeeping policies.
- Post-exposure reporting, evaluation, counseling, and follow-up procedures.
- Procedures for evaluating circumstances surrounding an exposure incident.
- Record-keeping, including sharps injury logs, training records, and annual plan updates.

Good housekeeping protects all workers and is every person's responsibility.

Reporting After an Exposure

Reporting after an exposure is required by OSHA. Employers should follow all federal and state requirements for recording and reporting occupational injuries and exposures. The following information should be included in the exposure report, recorded in the exposed person's confidential medical record, and made available to qualified health care professionals:

- Date and time of the exposure incident.
- Location of the exposure incident.
- Job classification of the employee exposed to BBP.
- Identification and documentation of the source individual, unless that identification is not feasible.
- The route and circumstances of exposure.
- Details of the exposure, including the type and amount of fluid or material and the severity of the exposure.
- Identified procedural changes which would prevent reoccurrence of any conditions that increased the risk of exposure.
- Engineer controls, work practice controls and PPE that was used.

Cleanup, Decontamination & Sterilization

- Wear gloves when cleaning infected areas.
- Clean the site with a bleach solution of ¼ cup bleach per one gallon of water.
- Absorb liquid with absorbent powder or other absorbent material.
- When liquid is absorbed, use scoops, cardboard or dustpans to collect as much of the absorbed material as possible and put material and scoops in a red biohazard bag.
- Wipe up remaining contamination with disposable wipes and put in the red biohazard bag.
- Remove and dispose of gloves in the red biohazard bag.
- Broken glassware, which may be contaminated, must not be picked up directly with the hands. Forceps, dustpan, spatula or other

equipment should be used. A brush should not be used to avoid splashing.

- All equipment and surfaces must be decontaminated immediately with a disinfectant after contact with blood or other potentially infectious materials. Use gloves to clean equipment.

Laundry

- Contaminated laundry must be handled as little as possible with a minimum of agitation.
- Contaminated laundry must be bagged or contained where used and should not be sorted or rinsed in that location.
- Contaminated laundry must be placed and transported in bags or containers labeled and/or color-coded in an appropriate biohazard containers.
- When contaminated laundry is wet and presents a reasonable likelihood of leakage or soak-through from the bag or container, the laundry must be placed and transported in bags or containers which prevent soak-through or leakage of fluids to the exterior.

The employer must ensure that employees in contact with contaminated laundry wear protective gloves and other appropriate personal protective equipment.

Post Exposure Follow-Up

Report the incident to your supervisor or the appropriate person i**mmediately after exposure to any pathogen. Failure to report may limit your** ability to prove exposure or obtain appropriate medical treatment. If you are exposed to bloodborne pathogens, a confidential medical evaluation and follow up must be immediately made available to you, at no charge. The evaluation and test results will be confidential. The employer is responsible for ensuring the confidentiality of your medical records. Your records cannot be disclosed without your written consent. During your medical consult with a healthcare professional, all test and follow-up plans will be discussed. All post-exposure treatments and plans should follow the CDC guidelines.

Airborne Pathogens

A disease is classified as airborne when respiratory droplets from one person can easily contaminate the next person and can be transmitted through the air.

Typically, airborne diseases travel on dust particles or respiratory droplets by way of sneezes, coughs, laughter and speaking. Viruses, bacteria and fungus may be to blame for causing such diseases.

Pathogens can remain airborne for several hours.

Simply washing the hands and covering the mouth when sneezing or coughing can decrease the prevalence of contracting an airborne disease.

Some of the most common examples of airborne diseases include influenza, chickenpox, and whooping cough. Although these diseases can cause serious harm and even death for some patients, they're usually easily curable if diagnosed and treated in time. More life-threatening airborne diseases include meningitis, anthrax, tuberculosis, and smallpox, though vaccines have advanced such that these diseases can be prevented.

Airborne pathogens can enter through the eyes, nose and mouth.

Airborne Transmission deponds on:

- The level of the infected carrier's contagiousness.
- Where the exposure occurs.
- How long the exposure lasts.
- How healthy you are at the time of exposure.

Transmission Occurs:

1. **Through the air**
   - Use good hygiene.
   - Cough and sneeze into a tissue or sleeve.
   - Dispose of tissues in a trashcan.
   - Wear a surgical mask.
   - Keep a distance of six feet between yourself and a sick person.
2. **Touching contaminated objects**
   - Avoid touching contaminated objects.
   - Avoid touching your eyes, nose and mouth.
3. **Hand contact**
   - Wash your hands thoroughly.

Airborne Infection Protection:

- **Stay healthy**. A healthy body means a strong immune system.
- **Be knowledgeable**. Look to reliable sources for information such as the U.S. Department of Health and Human Services.
- **Keep it clean.** Frequently wash hands or use alcohol-based hand sanitizers. Keeping an area clean and disinfected will kill the pathogens that have contaminated surfaces.
- **Use good respiratory etiquette**. Cough or sneeze into a facial tissue, or your sleeve, and wash your hands often. Dispose of tissue properly.

- **Consider wearing a facemask in public**. It may prevent inhalation of airborne particles from an infected person's coughs or sneezes.
- **Vaccines.** Keep current on vaccines; not all airborne have vaccines.
- **Be cautious with social contact**. Avoid handshakes or close contact, about six feet, with those who are ill.
- **Think carefully about travel**. Influenza viruses spread easily when people are confined to small spaces such as an airplane, train or bus.
- **Use good ventilation** and air cleaning processes.

When you are Ill

- Call your doctor if your fever is high.
- Stay home to prevent spreading the illness.
- Rest!
- Drink plenty of fluids.
- Take recommended medications.

Caring for the Ill

- Ask the patient's healthcare provider whether the patient should take antiviral medications.
- Keep the sick person away from other people as much as possible, especially those with weakened immune systems.
- Encourage the patient to rest and hydrate.
- Disinfect objects touched by the infected person.
- Protect yourself. Wash your hands often, use gloves and mask.
- Remind the patient to cover coughs and sneezes and to frequently wash their hands.
- Get medical care right away if the patient:
    - Has difficult breathing or chest pain.
    - Has purple or blue discoloration of the lips.
    - Is vomiting and unable to keep liquids down.
    - Shows signs of dehydration, such as feeling dizzy when standing, being unable to urinate.
    - Has seizures.
    - Is less responsive than normal or becomes confused.

Illness Signs & Symptoms, Reference Chart Inside Back Cover

Tuberculosis:

In 2006 the CDC estimated almost 14,000 cases of active TB. Pulmonary tuberculosis is an airborne disease that affects 10 people out of every 100,000 people in the United States. The exact cause for

pulmonary tuberculosis is the Mycobacterium tuberculosis bacteria. Treatment for pulmonary tuberculosis involves taking antibiotic medications to eliminate the bacteria. This treatment may be for more than six months, depending upon the severity of the tuberculosis.

Develop a TB exposure-control plan based on OSHA guidelines. Include annual education program for all employees; annual TB testing and management of any TB exposures.

Exposure: According to the CDC, tuberculosis is most commonly found in the following workplaces: health-care facilities, correctional institutions, shelters, long-term care facilities for the elderly and drug treatment centers.

Safe Workplace: Employers must provide a workplace that's free from recognized hazards that can cause death or serious physical harm. When feasible, employers should control exposure to TB by using ventilation, isolating patients and confining certain operations to restricted areas. When these controls aren't possible, they must provide respirators to all employees who breathe contaminated air.

Respirators: Employees must wear respirators whenever they enter a room housing someone with a suspected or confirmed case of TB.

Warning Signs: OSHA requires that warning signs be posted on respiratory isolation or treatment rooms. The sign must state "pulmonary isolation," "respiratory isolation" or "AFB isolation," and give specific measures that must be taken to interact with patients. Employers must also use biological hazard tags on components of air systems, so employees working on them know that they transport contaminated air. Tags must identify TB hazards.

Record Keeping: An employee who's been exposed to someone with active TB develops a tuberculosis infection, their employer must record the case on the OSHA 300 log. Positive TB skin tests and TB disease are both recordable. If an infection goes on to develop into disease during the 5-year maintenance period, the employer must update the original entry in the log to show the new information. Positive TB skin tests provided within two weeks of employment don't have to be recorded.

Accessing Records: Employers must keep records of all employees who have been exposed to TB in the workplace, a record of their TB skin test results and medical evaluations and treatments. A copy of the current fit-test record for each respirator user must also be kept. OSHA may have access to these records if it needs the information, and will use appropriate safeguards to protect employee privacy.

An Epidemic occurs when the incidence rate of a disease substantially exceeds the expected infection rate.

A Pandemic is an epidemic of an infectious disease that spreads through human populations across a large region, like a continent.